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The Journal of Allergy

VOL. I SEPTEMBER, 1930 NO. 6

Original Articles

SPECIFICITY OF POLLEN ALLERGENS*

GEORGE PINESS, M.D., AND HYMAN MILLER, M.D.
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THERE is perhaps no phase of allergy which is of greater practical significance than the principle of specificity. Since the allergic constitution became an accepted medical concept this principle has been the corner stone on which in great measure those investigators responsible for illuminating this heretofore obscure phase of constitutional abnormality have depended. Without it, the advance in knowledge concerning allergy might long have been delayed for it was a necessary postulate for the logical unfolding of the understanding of many abstruse problems. Despite the fact that the essential biologic explanation of specificity still eludes us, it has been an invaluable instrument for those of us who use it either to seek further for ultimate causes or for diagnosis and relief of symptoms. As with any instrument on which we are dependent it behooves us therefore to become intimately acquainted with its uses, its vagaries and its limitations. Any information concerning these qualities should be broadcast to add to the sum of our knowledge and properly therefore we find much in the medical literature attempting to elucidate them. To this fund of information the present exposition attempts to add, concerning itself with that particular aspect of specificity upon which the whole field of specific pollen therapy is based.

Ever since the possibility was broached (Cooke and Vander Veer[1]) that pollen specificity is not sharply delimited, much effort has been expended both pro and con to establish the exact nature of this limitation. The controversy has raged mainly about the specificity between the pollens of the high and low ragweeds. This has recently been well summarized and perhaps satisfactorily settled by Spain and Hopkins[2] who maintain that their allergens are identical. However, that the findings of these workers may be broadly applied to the whole group of Compositae is seriously to be questioned as the data collected (Lamson

*President's Address, before the Eighth Annual Meeting of the Association for the Study of Allergy, Detroit, June 23, 1930.

and Alles[3]) from our case records definitely establishes the fact that there is a distinct specificity so far as the production of intracutaneous reactions are concerned between many members of this botanical family.

Again, the specificity between the pollens of the Graminaceae has been challenged: more particularly the specificity between the pollens of timothy and Bermuda grass. This latter by Chobot[4] who obtained parallel intradermal and ophthalmic tests to the corresponding dilutions of the extracts of the two pollens and a cross desensitization of passive transfer sites by the method of Coca and Grove.[5] From this data the allergens of the two pollens are concluded to be identical.

TABLE I

TABLE SHOWING THE POSITIVE REACTIONS OBTAINED ON TESTING 599 PATIENTS INTRADERMALLY WITH 1-1000 EXTRACTS OF THE POLLENS OF 10 OF THE GRAMINACEAE

POLLENS TESTED	TOTAL REACTIONS	SINGLE REACTIONS
1. Cynodon dactylon	415	45
2. Lolium temulentum	306	6
3. Lolium perenne	258	3
4. Poa pratensis	232	10
5. Holcus halepense	228	21
6. Agrostis palustris	227	6
7. Lolium multiflorum	221	4
8. Phleum pratense	212	4
9. Distichlis spicata	201	6
10. Dactylis glomerata	196	4
	2496	109

Herewith is presented Table I, summarizing the positive reactions obtained on testing 599 patients intradermally with 1-1000 extracts of the pollens of 10 of the Graminaceae. These reactions were considered positive only if classified as three or four-plus. The patients on whom these reactions were obtained were derived from all parts of the country and as a group may be considered as having been exposed at one time or another to all ten of the pollens to a greater or less degree. During their stay in southern California, however, they must be considered as having been subjected to an overwhelming exposure to the pollen of Bermuda grass and to a minimum exposure to the pollen of timothy. Arranged in the order of frequency Bermuda grass pollen gave 415 reactions, by far the greatest number, and timothy pollen but 212. This in itself substantiates specificity, for Bermuda grass pollen is much more abundant in our atmosphere than any other grass pollen and presumably therefore exerts a greater specific sensitizing effect on susceptible individuals than any other pollen. Of far more significance, however, are the figures in the column labeled "Single Reaction." Here we find that 45 individuals reacted to Bermuda grass pollen alone and that a total of 109 individuals reacted to only a single pollen. Only 4 individuals reacted to timothy pollen alone, which is contrary to the claim that timothy contains all the specific allergens of the Graminaceae.

TABLE II

SHOWING THE NUMBER OF REACTIONS OBTAINED PER INDIVIDUAL PATIENT AND THE NUMBER OF PATIENTS REACTING TO EACH NUMBER

NUMBER OF REACTIONS PER PATIENT	NUMBER OF PATIENTS SO REACTING
1	109
2	105
3	79
4	70
5	49
6	45
7	47
8	38
9	28
10	24

In Table II there is graphically represented the number of reactions obtained per individual tested. The gradually diminishing total who react to the larger numbers of pollen can only be explained on the basis of some degree of specificity among the allergens. Incidentally it is to be noted in one individual who reacted to 9 pollens that the pollen which did not react was that of timothy.

Thus far we have spoken of specificity only between the members of a botanical family, the Graminaceae. In order to determine whether there is specificity between the species within a genus, we have included in Table I three species of the genus Lolium, viz., Lolium temulentum which gave 306 reactions and reacted 6 times solitarily, Lolium perenne which gave 258 reactions and reacted 3 times solitarily and Lolium multiflorum which gave 221 reactions and reacted 4 times solitarily despite the close botanical relationship between them.

To labor the point further is but to set up a straw man at which to tilt. The figures are sufficiently striking to allow of but one interpretation, that being that if the intradermal test has any value in determining specificity there is distinct specificity between the pollens of the family Graminaceae even to distinguishing between its species.

As has already been mentioned, Chobot[4] by means of cross desensitization of passive transfer sites has concluded that the allergens in the pollens of timothy and Bermuda grass are identical. This is contradictory to the conclusions which have just been presented, and led to an exact repetition of Chobot's investigation.

Blood was drawn from four hay fever patients who gave marked (4+) reactions to a 1-1000 extract of the pollens of both timothy and Bermuda grass. The sera were drawn off after clotting and centrifugalization, filtered undiluted through Seitz filters, stored in the ice box without the addition of any preservative, and used in the following investigation within a week after their preparation. Each serum in 0.05 c.c. quantity was used to sensitize 6 sites in the skin of from two to four recipients who gave negative family and personal histories to

TABLE III

SHOWING RESULTS OF ATTEMPTS TO DETERMINE SPECIFICITY BY DESENSITIZATION OF LOCAL PASSIVE TRANSFER SITES. ALL POLLEN SOLUTIONS USED FOR DESENSITIZATION AND TESTING HAD A STRENGTH OF 1-100

RECIPIENT		DONOR REACTED TO			DESENSITIZED BY BERMUDA REACTED TO		DESENSITIZED BY TIMOTHY REACTED TO		DESENSITIZED BY RAY REACTED TO	
		BERMUDA	TIMOTHY	RAY	TIMOTHY	RAY	BERMUDA	RAY	BERMUDA	TIMOTHY
1	A	4+	4+	4+	Neg.	Neg.	Pos.	Neg.	Pos.	Pos.
2	A				Neg.	Neg.	Pos.	Neg.	Pos.	Pos.
3	A				Neg.		Pos.			
4	A				Neg.		Pos.			
1	B	4+	4+	4+	Pos.	Pos.	Pos.	Neg.	Pos.	Pos.
2	B				Pos.	Pos.	Pos.	Neg.	Pos.	Pos.
3	B				Pos.		Neg.			
4	B				Pos.		Neg.			
1	C	4+	4+	4+	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.
2	C				Pos.	Pos.	Neg.	Neg.	Neg.	Neg.
1	D	4+	4+	3+	Pos.	Pos.	Neg.	Neg.	Neg.	Neg.
2	D				Pos.	Pos.	Neg.	Neg.	Neg.	Neg.
3	D				Pos.		Neg.			
4	D				Pos.		Neg.			
1	E	4+	2+	0	Neg.		Pos.			
2	E				Neg.		Pos.			
3	E				Neg.		Pos.			
1	F	4+	2+	4+	Neg.		Pos.			
2	F				Neg.		Pos.			
3	F				Neg.		Pos.			
4	F				Neg.	Neg.	Pos.	Neg.	Pos.	Neg.
5	F				Neg.	Neg.	Pos.	Neg.	Pos.	Neg.
1	G	4+	0	3+	Neg.		Pos.			
2	G				Neg.	Neg.	Pos.	Neg.	Pos.	Neg.
3	G				Neg.	Neg.	Pos.	Neg.	Pos.	Neg.

allergy and negative reactions to 1-1000 extracts of the pollens of timothy and Bermuda grass.

Twenty-four hours after sensitization site 1 was injected with 0.05 c.c. of a 1-100 Bermuda grass pollen extract (approximately 0.1 mg. nitrogen per cubic centimeter) and site 2 with a similarly strong extract of timothy pollen. Both sites in all recipients gave large reactions. On three succeeding days sites 1 and 2 were similarly treated, the reactions on the third day being negative. On the fourth day sites 1 and 3 received an injection of 0.05 c.c. of the timothy pollen extract and sites 2 and 4 an injection of 0.05 c.c. of the Bermuda grass pollen extract. Sites 3 and 4, the control sites not desensitized, invariably gave large reactions indicating that there was no loss in sensitivity of the skin of the recipient at the passive transfer sites. Referring to Table III it may be seen that Serum A was used to sensitize four recipients. In all four recipients site 1 was desensitized by Bermuda grass pollen extract and was thereby also desensitized to timothy pollen and site 2 was desensitized by timothy pollen extract but was not thereby desensitized to Bermuda grass pollen. This would seem to indicate that the allergens of Bermuda grass pollen include all the allergens of timothy pollen whereas timothy pollen does not contain all the Bermuda grass allergens. However, Sera C and D gave exactly the opposite result and Serum B gives the same result as Serum A in two recipients and that of Sera C and D in another two.

Sera E and F were obtained from individuals who gave markedly positive (4+) reactions to Bermuda grass pollen extract and only moderate (2+) reactions to timothy pollen extract. In all eight of the recipients of these sera, Bermuda grass pollen extract desensitized to timothy pollen whereas timothy pollen extract did not desensitize to Bermuda grass pollen.

Serum G, the donor of which gave a marked (4+) reaction to a 1-1000 Bermuda grass pollen extract on intradermal testing and a negative reaction to an extract of timothy pollen of the same strength, showed no desensitization to Bermuda grass pollen after desensitization with timothy pollen extract, as was to be expected.

Similar tests were made between the extracts of the pollens of the two grasses already discussed and that of ray grass (Lolium perenne). The results were similar as Table III shows except that those sites desensitized by timothy pollen extract were invariably desensitized thereby to ray grass pollen indicating that the allergens of ray grass pollen are all contained in the pollen of timothy.

Before drawing conclusions or summarizing results it is important to note the fact that with the single exception above noted in discussing Serum B a given donor's serum gave consistently the same results in desensitization regardless of the recipient. This is felt to be proof against criticism of the technic used.

Results may be summarized as follows:

There is evidence from which a conclusion exactly similar to that of Chobot[4] may be drawn, viz.: that the allergens of the pollens of the three Graminaceae here used are identical. There is also as good evidence from which to conclude that each is specific.

There is evidence which coincides with that obtained by Coca and Grove[5] to indicate that the allergens of one pollen may include all the allergens in the pollen of another member of the Graminaceae. There is also evidence to show that this is true only in certain instances.

And lastly, there is evidence which indicates that each pollen here tested has distinctly specific allergenic qualities.

We may conclude from our results either that the method of testing for specificity of pollen allergens by desensitization of passive transfer sites is unreliable or better still, considering the proof offered by the statistics presented from our data of intracutaneous tests that the pollen of each member of the Graminaceae has some specific allergen or allergens together with an allergen or allergens in greater or less degree common to all the members of the botanical family.

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THE "PATCH" TEST IN "CONTACT DERMATITIS" (DERMATITIS VENENATA)*

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THIS presentation is for the purpose of calling to your attention the value of the contact or patch method of testing for sensitization in skin eruptions suspected to be due to external excitants. This method of testing was popularized in Europe by Jadassohn and by Bloch and though it has been used in this country for a number of years, interest in it has been stimulated recently by Sulzberger.[1] It is only during the past year or so that it has taken its place with the scratch and intradermal methods of determining sensitization. The patch test is performed as follows:

A small amount of test material is placed on a clear and apparently healthy area of the skin, and if it is a dry substance, it is moistened with distilled water and covered with a small square of linen and a square of rubber tissue, which is held in place by a patch of adhesive plaster. This is left in place for approximately twenty-four hours and the reactions are then noted. A positive reaction consists of redness, and the formation of small vesicles at the point of contact. There is an important point to be considered at this time, and that is that occasionally a definite reaction does not appear until twenty-four hours after the patch has been removed, and also that sometimes it is necessary to leave the patch on an additional twenty-four or forty-eight hours before obtaining a positive reaction that otherwise would have been called negative.

This method of testing has its limitations and fallacies the same as other methods, but it is superior to the scratch and intradermal in determining sensitization to nonprotein substances which frequently cause dermatitis. These substances are a constant menace and are found in cosmetics, hair tonics, dyes, etc. An excellent and invaluable list of these external irritants will be found in a recent article by Weber.[2]

Table I shows the list of external irritants tested on ninety-eight patients proved to have "contact dermatitis," with the results obtained by the scratch, intradermal, patch and indirect methods of testing. Chart I shows the comparative value graphically of various methods of testing in "contact dermatitis."

*From the Depts. of Immunology and Dermatology, French Hospital, N. Y. C. Read at the Eighth Annual Meeting of the Association for the Study of Allergy, Detroit, January 24, 1930.

TABLE I

LIST OF EXTERNAL EXCITANTS TESTED ON 98 PATIENTS PROVED TO HAVE HAD CONTACT DERMATITIS WITH THE RESULTS OBTAINED BY THE VARIOUS METHODS OF TESTING

DIAGNOSIS	NO. OF CASES	METHODS OF TESTING							
		SCRATCH		INTRA-DERMAL		PATCH		INDIRECT	
		NEG.	POS.	NEG.	POS.	NEG.	POS.	NEG.	POS.
Poison ivy	8	8	0	4	4D	0	8	8	0
Pollen dermatitis (without HF or A)									
Ragweed	6	1	5	1	5	0	6	2	4
Timothy	1	0	1	0	1	0	1	1	0
Silk (real)	7	0	7	0	7	0	7	5	2
Rayon	4	4	0	2	2	0	4	4	0
Ursol (paraphemylene diamine)									
Fur dye	2	2	0	2	0	0	2	2	0
Soap (one)	4	4	0	4	0	0	4	4	0
Lanolin and wool	2	1	1	1	1	0	2	1	1
Orris root	4	0	4	0	4	1	3	4	0
Newspaper									
Brown section	4	1	3	0	4	2	2	4	0
Daily paper	2	1	1	0	2	1	1	2	0
Alcohol (externally)	6	6	0	1	5	0	6	6	0
Egg white (shampoo)	12	0	12	0	12	10	2	2	10
Flaxseed (hair tonic)	1	0	1	0	1	0	1	0	1
Linen	4	3	1	2	2	1	3	4	0
Camel hair	2	0	2	0	2	0	2	2	0
Penicillium	2	2	0	0	2	2	0	1	1
Metol or elon (monomethyl-p-amido-m-cresol sulphate)	2	1	1D	0	2	0	2	2	0
Glue									
Old book covers	1	0	1	0	1	0	1	0	1
Furniture (cabinet maker)	2	0	2	0	2	0	2	2	0
Violin maker	1	0	1	0	1	0	1	1	0
Primrose	4	3	1D	1	3D	0	4	4	0
Grapes	1	1	0	1	0	0	1	1	0
Icthyol (shaving cream)	2	2	0	2	0	0	2	2	0
Glycerine	3	3	0	2	1D	0	3	3	0
Human hair (transformation)	4	4	0	1	3	0	4	4	0
Ephedrine (pure) (spray)	1	1	0	0	1	0	1	1	0
Novocaine	4	4	0	2	2	0	4	4	0
Leather (hat band)	2	1	1	1	1	0	2	2	0
Automobile wheel (varnish)	1	1	0	1	0	0	1	1	0
Rosin (violin maker)	1	1	0	0	1D	0	1	1	0

D = Delayed Reaction
HF = Hay Fever
A = Asthma

CASE REPORTS

CASE 1.—

Ursol Dermatitis.—Female, aged seventeen, presented a dermatitis of the back of the neck of two months' duration. A strongly positive reaction was obtained with the patch method to ursol, a common fur dye; a negative to the fur itself. Tests with ursol by the scratch,

intradermal and indirect methods were negative. Removal of contact with fur improved the condition and renewed contact caused a reappearance.

CASE 2.—

Ragweed Dermatitis.—Female, aged twenty-seven. History of dermatitis of the face, neck, and hands, for the past five years, coming on about the middle of August and persisting until the beginning of November. This patient did not have hay fever or asthma and the family history was negative for hay fever, asthma, urticaria, migraine,

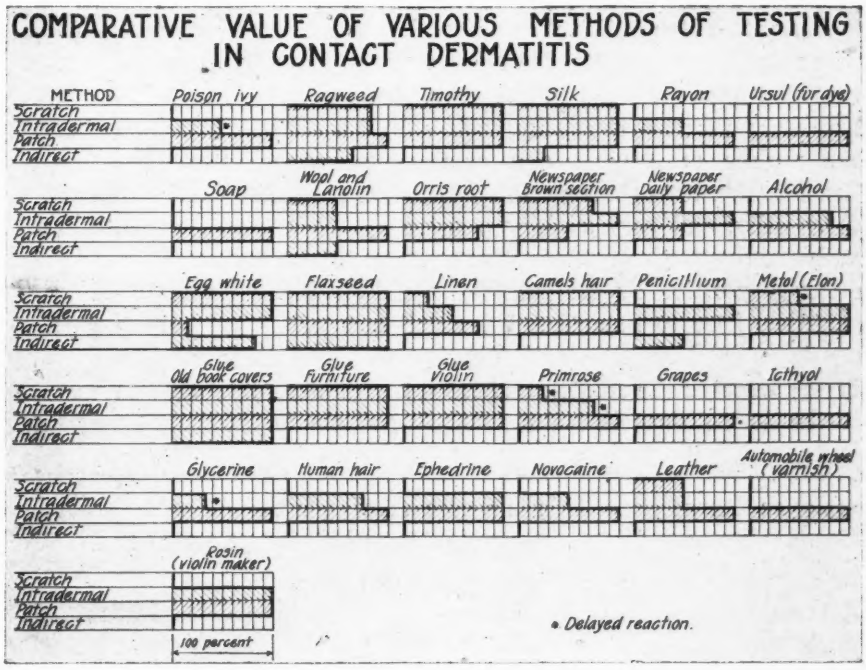

Chart 1.

etc. A positive reaction to both short and giant ragweed was obtained by the patch method. Tests with ragweed by the scratch, intradermal and indirect methods were negative. This patient was successfully desensitized beginning in March, 1929, and the treatment continued straight through until the end of the ragweed season. During the fall of 1929, was the first time this patient was free of dermatitis since its beginning, five years ago. This case is of particular interest because of the absence of other evidences of pollinosis and also because a positive reaction was obtained only by the patch method. A similar case was reported recently by Sulzberger and Wise,[3] and a series of cases of ragweed dermatitis was reported by Bengtsson.[4]

CASE 3.—

Ragweed Dermatitis.—Male, aged twenty-four. Dermatitis of the hands and side of the neck, which has recurred each fall for the past four years. This patient also is free of asthma and hay fever, and the dermatitis starts towards the end of August, and continues through until frost. A positive reaction to ragweed was obtained by all methods of testing. A positive passive transfer was obtained in this case. A particularly strong reaction by the patch method was obtained, using the crude pollen. It has been shown that many substances will give a positive patch test in the crude state and negative if extracted.

CASE 4.—

Dermatitis Due to Timothy.—Female, aged thirty-eight, gave a history of a recurring dermatitis for the past eight years, which begins in June and continues until the end of July. This patient is free of hay fever and asthma during the spring months, but has severe hay fever starting the middle of August and continuing through until early frost. Sensitization tests show a strongly positive reaction to the patch method to timothy, and very slightly positive by the scratch and intradermal and negative indirect; a negative reaction to ragweed by the patch, and strongly positive by the scratch, intradermal and indirect. It is interesting here to note that the patch test was positive to the pollen causing the dermatitis and negative to the pollen, causing the hay fever; whereas the scratch and intradermal were very slightly positive to the dermatitis pollen and strongly positive to the hay fever pollen.

CASE 5.—

Rayon Dermatitis.—This is a case showing a definite sensitization to rayon. We have had three similar cases but for purposes of illustration the case report of only one is presented.

Female, aged fourteen, has a persistent itching dermatitis of both arms, with patches on the back and upper chest. This has persisted for eight or nine months, with slight periods of remission following x-ray therapy. A strongly positive reaction was obtained by the patch method, and a very slightly positive reaction by the intradermal; negative to the scratch and negative passive transfer. Removal of all contact with rayon caused a disappearance of the dermatitis and renewed contact a recurrence. No other treatment was given during this time.

CASE 6.—

Lanolin Dermatitis.—This is a case of lanolin sensitization. This is important, not only because of the frequency with which lanolin is prescribed but because at times a patient will present symptoms to wool if it is rubbed into the skin, whereas no symptoms are present by casual contact. The patient whose case history is hereby presented, gave a positive reaction to lanolin, to crude wool and to wool extracts.

Male, aged twenty-six, has persistent dermatitis of both arms and both forearms. Duration nearly two years, without seasonal variations, except an almost complete disappearance during a period of two weeks at the seashore, at which time he was on the beach a great deal of the time. This patient had been applying lanolin to the arms every day. Symptoms disappeared on removal of the lanolin and on avoiding contact with wool as much as possible. Although this patient has not completely recovered, there has been about an 80 per cent improvement. Several checks have been made by applying lanolin, which immediately caused a flare-up.

CASE 7.—

Alcohol Dermatitis.—Male, aged thirty-six, has a persistent recurrent urticaria of nearly three years' duration. There have been very few periods of remission lasting more than a week or so. This case will serve to illustrate five similar cases. Repeated testing finally proved a specific sensitization to alcohol. Scratch and patch tests with alcohol were negative, whereas intradermal methods were strongly positive. Passive transfer was negative. As a part of these series, we will report two cases of persistent dermatitis localized to both hands, in which a specific sensitization to alcohol was also proved, but in which the alcohol acted as a skin irritant when applied locally and the drinking of alcohol caused exacerbation of the symptoms. These two patients used lotions containing alcohol on their hands several times a day. Removal of this exposure was followed by rapid disappearance of symptoms and also a disappearance of deleterious effects following the drinking of alcohol. In these two cases, positive reactions were obtained by both the patch and intradermal methods, negative to the scratch and indirect.

CASE 8.—

Egg White Dermatitis.—Female, aged thirty-two, has had a persistent dermatitis of scalp and neck for the past year and a half, or two years. Repeated tests showed a strongly positive reaction to egg white by scratch, intradermal, and indirect methods of testing; negative by the patch. Avoidance of eggs, or anything containing eggs did not improve the dermatitis, until after much investigative work, it was determined that this patient was in the habit of having a shampoo every week with a mixture containing eggs. The avoidance of this contact was followed by rapid improvement of the symptoms, which did not recur on eating eggs, in the absence of continued local contact. This case clearly indicates the importance of specificity of sensitization tests in such cases. We are well aware of the many cases where positive reactions are obtained to substances that are irrelevant, but we believe that the frequency of these irrelevant reactions and the importance attached to them would be greatly diminished if proper check tests were carried out in each case.

CASE 9.—

Dermatitis Due to Green Penicillium.—Female, aged forty-five, gave a history of recurrent urticaria for the past eight months. The urticaria invariably began after retiring at night, and completely disappeared only during a period of three weeks, at which time the patient was away from her home. A pure growth of green penicillium was obtained on Sabaroud plates exposed both in her bedroom and between the sheets in the bed. Extracts made of this mould gave a strongly positive reaction by the intradermal method and a positive passive transfer. *A negative reaction was obtained by the patch* and scratch. A change of residence with the purchase of a new bed, mattress, linen, etc., resulted in complete disappearance of the symptoms. This patient did not present any symptoms of asthma, coryza, or any other expression of sensitization.

CASE 10.—

Dermatitis Due to Handling Grapes.—Male, aged thirty-five, had a persistent dermatitis of both hands for the past four months. A positive reaction was obtained by the patch method to grapes and negative test by the scratch intradermal and indirect methods. This patient was in the habit of handling grapes almost every day in his line of business.

CASE 11.—

Ephedrine Dermatitis.—Male, aged fourteen, has had a dermatitis of the upper lip and nostrils for the past two months. This patient is an asthmatic, due to sensitization to wheat. It was proved that the eczema of the upper lip and nose was caused by an ephedrine spray which is used almost every day. Sensitization to ephedrine in skin conditions has been reported frequently. The point of interest in this case was that the boy had been using an ephedrine spray for nearly twelve months without any trouble and that it was only within the past two months that a specific hypersensitization had developed. Skin tests to ephedrine were positive by the patch and intradermal and negative by the scratch and indirect methods.

CASE 12.—

Dermatitis of Hands Due to Auto Wheel (Varnish?).—Male, aged twenty-eight, presents a dermatitis of one month's duration confined to that area of the hand which comes in contact with an automobile wheel. Avoidance of all contact with the automobile wheel of his car caused a rapid disappearance of the dermatitis, though he continued driving other cars. Repeated tests with extracts of the wood and of the varnish, etc., on the automobile wheel, which was therapeutically shown to be the cause of the dermatitis, were all negative. Although it was impossible to determine the cause in this case, it is believed that some material to which the patient was sensitive was transferred to the wheel

by someone else. After arriving at this belief, the wheel was thoroughly scraped and revarnished and the patient has been able to drive without any further mishap. This case is reported merely to call attention to this avenue of exposure.

SUMMARY AND CONCLUSIONS

The results of various methods of testing 98 patients suffering from "contact dermatitis" are demonstrated.

The comparative value of these methods is indicated in Table I and Chart 1.

The patch method of testing is superior to other methods in determining sensitization to contact excitants, and particularly those of non-protein nature.

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ALLERGY CONSIDERED AS A SPECIAL TYPE OF ALKALOSIS*

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I WISH to present very briefly in this paper the hypothesis that potential alkalosis is an important causative factor in allergy, meaning by "potential alkalosis" the tendency of the individual to store up too much reserve alkali without necessarily becoming clinically alkalotic. In support of this contention I shall attempt to show that the more acidotic the patient is rendered, whether by one or other of our therapeutic measures, by intercurrent disease or environmental change, the less allergic he becomes. The evidence is presumptive, indeed in some instances perhaps even fanciful, but its presentation may not be entirely unwarranted.

1. *Diabetes Mellitus.*—The diabetic individual is acidotic, even though at all times he may not be showing ketone bodies in the urine. But Joslin[1] states that he is rarely allergic, and cites in support Rackemann and Walker.

2. *Starvation.*—Several of the changes observed during starvation, even if only partial, are directly attributable to the acidosis which supervenes. According to my thesis it is this acidosis which caused the unprecedented decline in the allergic diseases among the citizenry of the Central Powers during the latter years of the World War, when they were considerably undernourished.

3. *Pregnancy.*—It is a well-known fact that allergic symptoms sometimes disappear entirely during the period of gestation, to reappear after the birth of the baby. It is equally well known that the alkali reserve is sometimes much lowered during pregnancy.

4. *Acute Infectious Diseases.*—A bout of fever very often entirely relieves allergic maladies for the time being. During febrile conditions, the acidotic tendency is pronounced, clinical acidosis sometimes having to be seriously combated. It would seem that in receding during fever, the allergic diseases are really being drowned in an acid flood.

5. *Sea Voyaging.*—Many allergics, both pollen sensitive and non-pollen sensitive, are completely relieved by a trip to sea. The recent studies of seasickness made by Oriel[2] distinctly show that in seasickness there is a pronounced clinical acidosis, and also that in voyagers not seasick there is nevertheless a metabolic disturbance in the direction of acidosis. This acidotic factor in life at sea was long ago recognized by experienced ships surgeons, who are wont empirically to advise pas-

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sengers to eat exclusively of vegetables and fruits (i.e., substances with an alkaline ash) if they would avoid becoming sick.

6. *Sojourning at High Altitude.*—The immunity from attacks experienced during a visit to a region with an altitude of 4,000 feet or more is not understood, since it is now known to occur in nonpollen sensitive as well as pollen sensitive cases. Here again I would offer as an explanation the metabolic rebalancing in the direction of acidosis which occurs. The adjustment to altitude is acapnial in nature; i.e., the loss of CO_2 through the augmentation of respiration is compensated by excretion of the excess alkali left in the blood; as a result the individual does not become acidotic, but he does lose alkali.[3] Therefore, in sending our patients to the Rockies or the Alps to obtain relief from allergic maladies we are sending them to regions where they undergo a depletion of alkali reserve.

7. *Asthma in the Young.*—In any of the acute maladies of the very young, acidosis is always to be feared for the reason that the balance is more easily tipped over toward the acid side in youngsters than in their elders. It is worthy of note that in the treatment of very young allergics any of our routine palliative measures are usually more effective than in grown children or adults.

8. *Gastric Acidity and Allergy.*—The occurrence of hypochlorhydria and even achylia has frequently been observed in allergy, and it is interesting to note that in recent experimental studies of urticaria[4] it was found that hive production was accelerated by hypochlorhydria and retarded by hyperchlorhydria. I believe this alteration in gastric acidity is but a reflection of the high alkali reserve of the blood in allergics. In the normal individual the period of active acid secretion in the stomach coincides with a decrease in urinary acidity; that is to say, there is a lessened acidity of the blood during this time. But in the allergic individual, with his high alkali reserve, there is sometimes hypochlorhydria because the blood has so little acid forming material to spare.

9. *Calcium Therapy.*—It would seem that calcium therapy is really in effect acid therapy. Calcium chloride given by mouth increases the acidity of the urine because much of it is converted into the relatively insoluble carbonates and phosphates, which are then lost in the feces; but the liberated chloride ion is absorbed and serves to increase the proportion of fixed acid in the body.[5] Calcium lactate is probably also available for reducing the alkali reserve since some of it is very likely converted into the chloride in the stomach, and it is also known that it is more completely absorbed if given between meals when the intestinal tract is less alkaline,[6] or when lactic acid fermentation in the tract is increased by the administration of large quantities of lactose. Sollmann[7] says that "the blood calcium cannot rise materially above the normal limit unless the acid-base balance is shifted toward the acid side."

Therefore, whenever we give calcium and actually do obtain a rise in its level in the blood, we have accomplished this only by increasing the relative acidity of the medium. I believe that it is this fact, rather than the effects of the calcium ion itself, that accounts for the good results which sometimes follow calcium therapy.

10. *Whiskey and Aspirin.*—Duke[8] has recently called attention to the value of this combination in allergy. Here are brief notes on these two drugs: Alcohol slightly increases the absorption of the salicylates and is itself quickly absorbed and more than 95 per cent oxidized to CO_2 and water, with acetic acid probably as an intermediate stage. This breakdown, which tends to increase the acidity of the tissues, begins within about five minutes but proceeds slowly, the combustion of one ounce of whiskey requiring about four hours for completion, during all of which time we are adding to the acid side, as shown also by a relative increase in urinary ammonia. The salicylates in therapeutic doses are now definitely known to cause fixed-acid acidosis, i.e., a decrease in the alkali reserve with a respiratory stimulation so that the P_H remains unchanged; there is also an increase in the lactic acid content of the blood.[9]

In short, whiskey and aspirin cause relative acidosis.

11. *Mineral Acid Therapy.*—For several years I[10] have been advocating the use of the following formula in the treatment of hay fever:

℞

Nitrohydrochloric acid (*not* the dilute)	℥ ivss	(18.0)
Water to make	ℨ iv	(120.0)

Label: One teaspoonful in water after meals and again upon retiring as near midnight as possible.

I am now able to report the results obtained in 237 cases by thirty-four physicians, each using the remedy in his practice for the first time, except in my own 21 cases, some of which have been treated repeatedly for several years (Table I). Table II shows the results at present being obtained with desensitization methods. In Table III the two methods are compared and it is shown that they are equally effective.

Regarding the desensitization table, the figures here shown are admittedly high; i.e., they represent what is being accomplished by expert allergists and by no means by the general practitioner. Also they do not show the 2 to 3 per cent of patients who are actually made worse by the treatments,[11] nor the 10 per cent who suffer constitutional reactions,[12] nor the more than 50 per cent who have more or less severe local reactions. The treatments must of course be begun many weeks before the beginning of the season.

As for acid therapy, it may be said that the treatment is begun only when the symptoms appear; there are no reactions; and the figures

TABLE I

RELIEF OBTAINED BY ACID THERAPY IN 237 CASES OF HAY FEVER

NO. CASES	RELIEF COMPLETE	RELIEF MARKED	PER CENT SUCCESS	NO. CASES	RELIEF COMPLETE	RELIEF MARKED	PER CENT SUCCESS
21	18	2	85	4	1	2	75
10	7	1	80	1		1	100
13	5	7	92	1	1		100
2			0	33		6	18
2	1	1	100	3		3	100
8	1	2	38	6	4	2	100
11	6	2	73	1		1	100
6	4	2	100	6	6		100
6	3	2	83	10	4	5	90
5	1	2	60	2	1		50
2	2		100	12	4	5	75
6	4	2	100	5	2	3	100
4		2	50	14	3	9	85
10			0	3	1	1	66
14	8	4	86	6	1	3	66
2			0	4		1	25
2			0	2		1	50
Total number of cases							237
Number of cases obtaining complete or marked relief							160
Percentage obtaining complete or marked relief							67

TABLE II

RELIEF OBTAINED BY DESENSITIZATION IN 2,185 CASES OF HAY FEVER

AUTHORITY	NO. CASES	RELIEF (IN PER CENT) COMPLETE	MARKED	SLIGHT	NONE
Rackemann	91	9.0	62.0		28.0
Vander Veer	1744	23.0	49.0	18.0	10.0
Bernton	56	25.0	40.0	24.0	10.0
Piness	202	29.6	40.0	21.4	9.1
Smith	92	10.0	65.0	19.0	6.0
Averages (in per cent)		19.3	51.2	20.6	12.6
Average success (in per cent)		70.5			
Average failure (in per cent)				33.2	

TABLE III

COMPARISON OF RESULTS IN ACID AND DESENSITIZATION TREATMENT OF HAY FEVER

	NO. CASES	COMPLETE RELIEF PER CENT	MARKED RELIEF PER CENT	SUCCESSFULLY TREATED (MARKED PLUS COMPLETE) PER CENT	NO RELIEF PER CENT
Acid treatment	237	37	30	67	33
Desensitization	2185	19	51	70	30

shown in Table I probably represent the minimum that can be accomplished with the acid, for the reason that the amount required for different individuals must surely vary but these patients were all given the same dose, and also because no precautions were taken in any of these cases to guard against the taking of fruits and green vegetables whose alkali ash might completely combat the attempt to lower the alkali reserve with the acid.

SUGGESTIONS FOR FUTURE STUDY

1. Thorough chemical and physical studies of the blood and urine should be made in the large allergy services, with the object of determining the effect of all types of therapy, including desensitization, upon the acid-base balance.

2. Ketogenic feeding should be instituted in a carefully controlled series of asthma and hay fever cases.

3. A study of acid therapy upon a large scale should be undertaken. Perhaps the best agents to use will be found to be U.S.P. dilute hydrochloric acid in large doses, ammonium chloride or sodium acid phosphate. I see no reason why nitrohydrochloric acid should be in any way superior to these more familiar substances. In any case the patients should be urged to eat freely of meats, fats and cereals, while green vegetables and fruits should be strictly forbidden because of their alkaline ash.

4. The effect upon allergy of all other acidotic states, such as that occurring during exercise and as a part of the picture in severe chronic nephritis and in acute diarrhea, should be studied.

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ELM POLLEN AS A COMPLICATING FACTOR IN HAY FEVER*

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THE half-dozen common species of elm native to the eastern and central states offer some interesting problems to the student of allergy. On account of the wonderful adaptability of the various elms, particularly American Elm (Ulmus americana), few cities in the United States are without numerous elms used as street and park trees. Attention has already been called to the elm as a cause of hay fever,[1] but we believe its importance has been underestimated.

The four common spring pollinating species come into bloom so early in the spring that their effect has only been noticed in extreme cases. Our attention has been drawn to the subject as a result of routine atmospheric pollen investigations and some interesting experiences in the clinic. We find that the season of distribution of elm pollen varies considerably in a given locality, due to the extremely changeable weather conditions of March and April. Not only does the time of the season vary, but the quantity of pollen distributed may be ten times as much one season as another. One year in Kansas City there were days when the elm count was as high as we ever find ragweed. Rainy weather during the apex of pollination can reduce the quantity very measureably. With the exception of pine pollen, there is no wind-borne tree pollen of such buoyancy as elm. Granules are often encountered in a locality long before and long after the local season of pollination.

Of particular interest is the local problem of the fall-blooming elms of the south. There are two species, each of comparatively local distribution, both pollinating in September. Red elm (Ulmus serotina) is common in southwest Kentucky, Tennessee and northern Alabama, Georgia and Mississippi. Scrub elm (Ulmus crassifolia) is found in central and northern Texas, Oklahoma and southern Arkansas. Blooming as they do during the ragweed season, they cause some perplexing complications in ragweed hay fever.

The extreme buoyancy of these fall elm pollens is shown by the fact that granules are often found hundreds of miles from the extreme limits of distribution of the species. Thus, while there is no record

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of a single tree of either of the two fall pollinating elms in Indiana or Illinois, the pollens are frequently found on pollen slides in Indianapolis.

In a recent publication,[2] one of us (J. H. B.) reported our experience with elm pollen in March, 1929. We called attention to the fact that coincident with a very sharp and large shower of elm pollen in the air we had the occurrence of hay fever symptoms in the large majority of those patients whom we had had under treatment for cedar hay fever and who remained free of symptoms for practically the entire period of cedar pollination. We also saw a few patients who were sensitive to other pollens and had been under our treatment at other times of the year. We called attention to the fact that we had not had such a

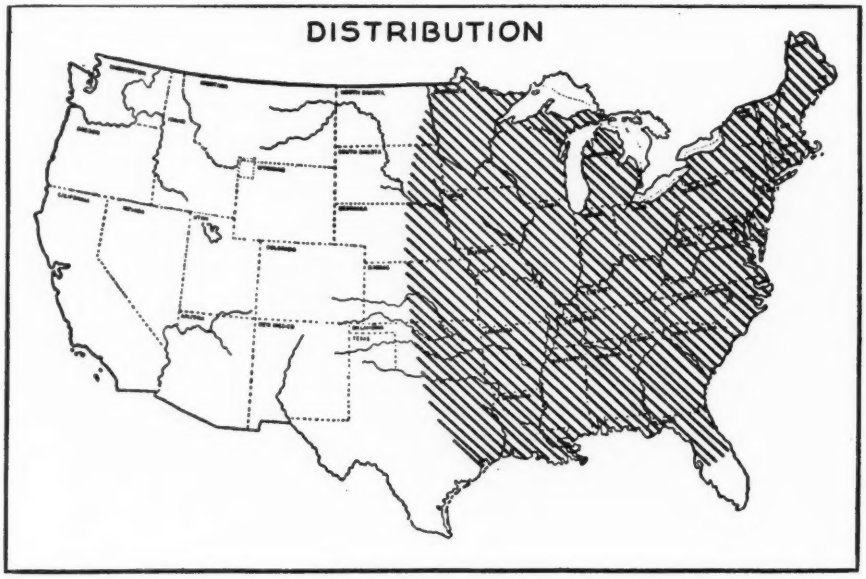

Chart 1. Spring blooming elms.

situation to contend with in previous years and felt that this was undoubtedly an unusual shower of pollen. We were also struck with the fact that those patients who came in complaining of hay fever symptoms during the elm pollen shower were all allergic patients sensitive to other pollens. We did not see any patients who had a sensitiveness to elm alone, and we did not see any patients who had a history of a previous hay fever at this particular time of the year. There may have been other individuals who had never had hay fever previously who came down with it, and this may have been their only allergy, but we saw none of such patients. We suggested that this may be some evidence of a lack of sharp specificity in the reaction of allergic individuals, and that given a sufficiently large dose of pollen these individuals, already known to be allergic to other pollens and reacting

clinically to other pollens, might show reaction to this. Our experience with the fall season of 1929 lends some further interesting confirmation of these ideas.

Ragweed pollen first appeared in the air in Dallas about August 15, but was small in amount until the beginning of the second week in September (Chart 3). Almost immediately there followed the appearance of elm pollen which at once became greater in amount than the ragweed and persisted at a high level for a week then rapidly declined until the twenty-second of the month after which none was found. Pollen slides made in the fall of 1928 showed the presence of elm pollen but the amount was small and so far as we could determine of no clinical significance.

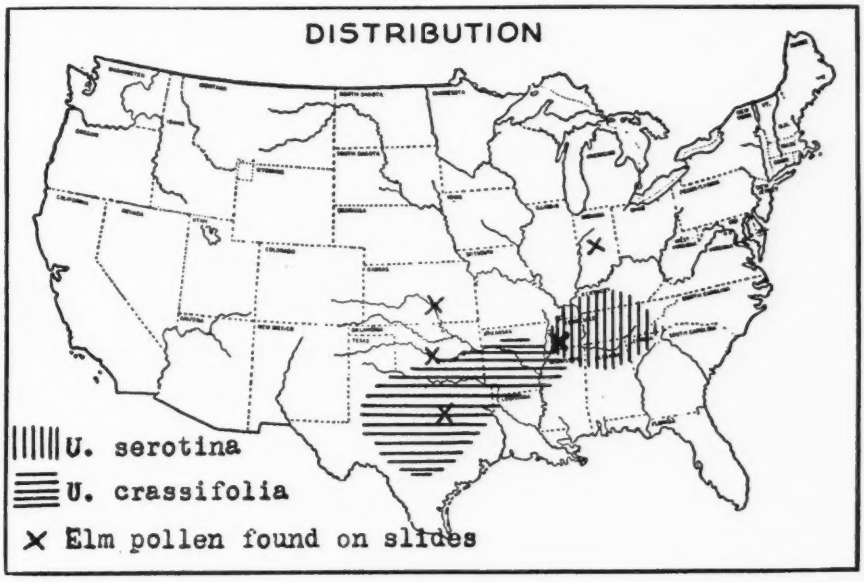

Chart 2. Fall blooming elms.

While we knew of the fall-blooming elm, and our experience of the spring season had convinced us that it could be of clinical importance, we had not thought of it as causing any trouble in the fall and consequently made no effort to protect patients against it.

Coincident with the appearance of elm pollen there was a sudden onset of hay fever symptoms affecting approximately 50 per cent of the ragweed sensitive patients. Some of these had been entirely free of symptoms and became free again on the disappearance of elm pollen from the air. Those who had had some trouble before this time reverted to their former condition at the end of this brief period. In addition to these, six patients came in for examination during this period, all of whom had a history of autumnal hay fever and who had a definite aggravation of symptoms with the appearance of elm pollen in the air.

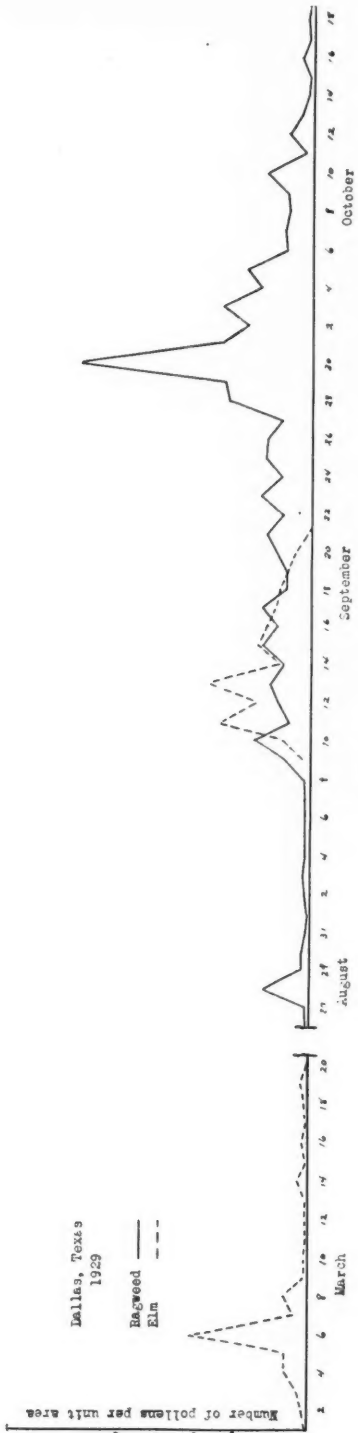
Dallas, Texas
1929
Ragweed
Elm
Number of pollens per unit area
March
August
September
October

Chart 3.

All of these individuals were found to react to both ragweed and elm pollen. With the disappearance of the elm pollen from the air they showed some improvement but continued to have considerable hay fever throughout the ragweed season.

Skin tests indicate that a considerable number of persons are elm-sensitive, but the small amounts usually present in the air do not cause clinical reaction. Pollen studies show that there may be an enormous variation of amount of elm pollen in the air, consequently it may be of no importance in one season, while it may be the cause of a great deal of trouble in another. With our Dallas experience in mind, we are afraid to allow any of our elm-sensitive patients to go into future seasons without protection.

One evidence of lack of sharp specificity is seen in the fact that two ragweed sensitive individuals had hay fever from elm pollen both in the spring and fall of 1929. In other words, they reacted to both Ulmus americana and Ulmus crassifolia. Neither of these persons had any knowledge of previous similar attacks.

The autumnal elm situation corroborates and emphasizes the findings in the spring that, so far as our experience goes, we have seen no elm-sensitive patients who were not, also, sensitive to other pollens and had a previously existing hay fever from pollen other than elm.

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1717 PACIFIC AVENUE.

THE VITAL CAPACITY IN BRONCHIAL ASTHMA*

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METHODS of objective measurement of the severity and progress of chronic disease are valuable and unbiased aids in clinical judgment. Just as in other conditions reliance on subjective symptoms in bronchial asthma may be misleading at times. It would be important to find some means of objectively measuring the severity of the bronchial asthma, its probable prognosis, and the influence of complicating factors. With this thought in mind vital capacity determinations were made in a number of asthmatics at various stages of the disease.

The term "vital capacity" denotes the maximum interchange of air in the lungs, and is measured by noting the amount of air exhaled in a maximum expiration after a maximum inspiration. This figure is quite constant for the individual, and is dependent in health on the size, weight, age, and sex. It deviates from the normal standard in many pathologic conditions, but is more particularly influenced by disease of the heart or lungs. A decrease from the normal is to be expected in any condition in which there is dyspnea.

Although the subject of vital capacity is an old one and much has been written concerning it, very little has been said about it in relation to bronchial asthma. This is probably due to the fact that it is such an evident observation that breathing during the asthmatic attack is greatly hampered, while breathing between attacks is apparently normal. Borelli,[1] in 1679, apparently made the first measurement of the volume of air taken into the lungs at a single inhalation. However, the first extended study of vital capacity was made by Hutchinson[2] in 1846. He made detailed studies on respiration, including the vital capacity, on nearly 3000 individuals, most of whom were normal: a few were diseased, but apparently none had asthma.

In 1912 Staehlin and Schultze[3] reported spirographic studies in emphysema and asthma and found the vital capacity normal in some and decreased in others. Plesch,[4] in 1913, tested among other conditions four cases of asthma and found a reduction of vital capacity, especially if associated with emphysema. In 1917, Peabody and Wentworth[5] reported seven vital capacity observations on six cases of bronchial asthma.

*From the Asthma and Hay Fever Clinic, Northwestern University Medical School.
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They found in the best condition between attacks a range of 65 to 122 per cent of the normal vital capacity: in only one case was it below 85 per cent.

Myers,[6] in 1920, reported vital capacity readings in 20 cases of bronchial asthma. During the attacks the capacity was greatly reduced, in some cases to as low a figure as 18 or 20 per cent of normal. After the acute attacks subsided the vital capacity returned to normal in all cases except four with emphysema and three beyond the age of fifty. He says that in most cases the capacity remained normal as long as the chest was kept free from râles. There are no figures given for age of patients, duration of disease, nor very little other data. In a later study of 17 cases of bronchial asthma Myers and Cady[7] found a marked reduction of vital capacity during attacks and normal between attacks.

Most of the reports, such as that of Mudd,[8] and that of Leas,[9] are concerned with the vital capacity during the time the patient is having symptoms of asthma. One of the most interesting reports, perhaps, is that of Stewart[10] who studied the vital capacity in 17 children. Of these 10 had no asthma at the time of the tests. He concludes that in children the vital capacity quickly returns to normal after an acute attack and that even in children subject to the disease for several years there is no permanent reduction in the vital capacity of the lungs.

In studying the effect on the heart of long-standing bronchial asthma, Alexander[11] reported vital capacity readings in 34 out of the 50 cases studied. His figures range from 20 to 95 per cent of the normal but there are no data given as to whether the readings were taken during or between attacks.

METHODS OF STUDY

This report concerns a study of the vital capacity of 88 cases of bronchial asthma. Measurements were made with a spirometer with the patient in the erect posture. At the time of each test several determinations were made and the highest reading recorded. In many patients, for the sake of serial study and for observation under changes in clinical condition, repeated readings were made. Records were kept of the clinical condition of the patient at the time of the test, the sex, age, height, weight, and duration of the asthma.

The readings were recorded in cubic centimeters and subsequently computed in terms of percentage of normal. The normal standards used for adults were those based on calculations from surface area, using West's ratio of 2.5 liters of air to one square meter of body surface for men, and Myers'[12] ratio of 1.92 liters for women. For children Stewart's tables as shown in Myer's monograph were employed.

Readings were taken at various degrees of asthma and between attacks. Determinations were also made from time to time to judge

progress of the condition. In the very severe attacks readings were of course impossible.

RESULTS OF STUDY

Table I shows the vital capacity readings taken during the presence of asthma or cough. In this group 44 cases were studied with an average age of thirty-seven and four-tenths years and average duration of asthma eight and seventy-five-hundredths years. The average vital

TABLE I

VITAL CAPACITY IN BRONCHIAL ASTHMA—DURING TIME OF SYMPTOMS

CASE NO.	SEX	AGE	DURATION YEARS	VITAL CAPACITY—PERCENTAGE OF NORMAL			
				CHRONIC COUGH	TIGHTNESS IN CHEST	MODERATE ASTHMA	SEVERE ASTHMA
2	M	54	1	83			
4	M	41	4			31	
9	M	10	12			34	
10	M	44	½			72	
12	M	35	1			49	
13	M	58	11	73			
16	M	42	3			46	
17	M	12	9			66	
18	F	66	14			40	
19	M	38	25			61	40
20	F	34	10		64	59	
22	M	32	27			55	
23	M	45	9		51	71	34
24	M	9	9	89			
25	M	12	8		83	75	
27	F	61	10	29			
30	M	47	10	73			
36	F	32	6			52	
37	M	42	2			69	
38	M	23	3			48	
39	F	24	4 mo.			73	
40	F	35	2			60	
41	F	44	6		83		
43	F	38	6	73			
44	M	59	3	62			
45	F	30	5			76	
47	M	30	1½	92			
49	M	12	6	97			
51	F	12	11	98			
52	F	21	14			68	
54	M	55	6	71			
59	M	35	10		75	63	39
60	M	36	30		85		
61	M	50	10			62	51
62	M	10	7	70			
63	M	30	2	48			
64	F	39	15			69	
66	M	47	2			72	
68	F	44	10			52	43
71	F	21	17			82	
74	M	42	9			59	
76	F	50	12	57			
78	M	42	12	69			
81	M	11	10			69	
Average		37.4	8.75	72.3	73.5	60.5	41.4

capacity in 6 cases with tightness in the chest was 73.5 per cent of the normal; 27 cases with moderate asthma, 60.5 per cent; and 5 cases with fairly severe asthma, 41.4 per cent. No readings were attempted during very severe attacks. The above figures are what one would expect, of course, from clinical observation.

Vital capacity determinations in the intervals of freedom from asthma are divided into two groups, those for adults and those for children. In Table II are tabulated the readings in 48 cases of adults (sixteen years or over), taken between attacks. In this group the average age was thirty-five and five-tenths years and average duration of asthma seven and five-tenths years. The extremes of vital capacity were 29 and 116 per cent of the normal and the average was 82.3 per cent.

On the other hand, in 15 children (under sixteen years), as shown in Table III, the average vital capacity between attacks was 97.8 per cent of the normal. The extremes were 70 and 125 per cent. The average age was ten and five-tenths years and average duration of asthma six and five-tenths years. It is thus seen that in spite of the very slight difference in the duration of the asthma there is a greater reduction in the vital capacity in asthmatic adults than in children.

The figures from Tables II and III are recorded graphically in Fig. 1. Here the dots represent the individual cases with the percentage of vital capacity plotted against the age. The line represents the averages of vital capacity percentages computed at four-year intervals of age. It will be seen that there is a definite tendency for this curve to descend. This means, of course, that in bronchial asthma there is apparently a diminution in the percentage of vital capacity with increasing age. This would signify that there is a greater probability of complications, probably in the chest, with increasing age. The most likely complications to be considered are cardiac changes, emphysematous changes in the lungs, or other pulmonary complications. From the evidence at hand it is not clear so far as to the cause of this functional change, although emphysema seems to be the most likely.

A group of 15 bronchial asthmatics, comprising 11 adults and 4 children, were separated from the others because of the presence of a chronic cough between the asthmatic attacks. In these cases the average vital capacity between asthmatic attacks was 72.3 per cent (Table I). It is interesting to note that this is a marked reduction compared with 82.3 per cent in adults and 97.8 per cent in children without a chronic cough (Summary, Table IV). The explanation for this vital capacity decrease in asthma cases with chronic cough is not entirely clear. In view of the finding of normal vital capacity figures by Myers[7] in a series of 156 cases of acute bronchitis and 156 cases of chronic bronchitis it would seem that the mere factor of bronchitis could not account for this observation. Perhaps the chronic cough is productive of a higher

TABLE II

VITAL CAPACITY IN BRONCHIAL ASTHMA—BETWEEN ATTACKS
ADULTS (SIXTEEN YEARS OR OVER)

CASE NO.	SEX	AGE	DURATION YR.	VITAL CAPACITY—PER CENT NORMAL			CONDITION
				INITIAL	MINIMAL	MAXIMAL	
1	F	36	1½	57			Myocardial involvement
2	M	54	1	78		89	Slight cough at night
3	F	24	7	80	80	80	Frequent attacks
5	M	32	1	83	73	83	Daily attacks
6	M	43	12	93			Very frequent attacks
8	F	23	12	93	86	100	Frequent attacks
13	M	58	11	69	69	77	Cough constant. Considerable emphysema
14	M	40	11	74	74	86	
15	M	37	6	79			
21	M	45	10	68			
22	M	32	27	75	75	95	
23	M	45	9	51	51	71	Asthma almost constantly
26	M	53	18	79			
27	F	61	10	29			Cough constantly
28	F	17	14	86	77	86	No attack for 3 mo.
29	M	27	8	131			Asthma attacks only occasional
30	M	47	10	73			Chronic cough. Bronchiectasis
31	M	22	2	101			Asthma attacks only occasional
32	M	21	8	106		116	Attacks at long intervals
33	M	44	4	84			
34	F	24	½	94			Asthma almost constantly
35	F	26	2	108			
40	F	35	2	77		77	

TABLE II—CONT'D

CASE NO.	SEX	AGE	DURATION YR.	VITAL CAPACITY—PER CENT NORMAL			CONDITION
				INITIAL	MINIMAL	MAXIMAL	
42	F	22	7	61		66	Periodic, but extremely severe
43	F	38	6	70		77	Cough almost constantly
44	M	59	3	70	57	73	Cough constantly
46	F	39	5	90	86	93	
47	M	30	1½	89		94	Cough between attacks
48	F	34	3	105			
53	M	30	7	94			
54	M	55	6	71			Cough constantly
56	M	23	2	80		87	
57	M	45	2	87			
58	F	22	2	107			
59	M	35	10	75	70	93	Asthma almost constantly
63	M	30	2	48			Chronic cough
65	M	43	19	77	76	86	
69	M	35	2	81	81	93	Slight cough
70	F	44	12	88	88	88	Attacks at long intervals
75	M	36	5	87			
76	F	50	12	57			Coughs between attacks
78	M	42	12	66		72	Coughs between attacks
79	M	23	9	106	104	106	
83	F	25	3	95		105	
84	F	31	6	89	89	89	No asthma for 2 weeks
85	M	21	18	84	82		
87	M	22	4	107			No asthma for several months
88	M	26	15	100			No asthma for 2 weeks
Average		35.5	7.5	82.3	78.0	86.2	

TABLE III

VITAL CAPACITY IN BRONCHIAL ASTHMA—BETWEEN ATTACKS
CHILDREN (UNDER SIXTEEN YEARS)

CASE NO.	SEX	AGE	DURATION YR.	VITAL CAPACITY—PER CENT NORMAL			CONDITION
				INITIAL	MINIMAL	MAXIMAL	
7	F	11	7	94	94	94	Very frequent attacks
11	F	10	3	122	90	125	Fairly frequent attacks
24	M	9	9	89			Chronic cough
25	M	12	8	100	83	100	Severe chronic asthma
49	M	12	6	86	86	108	Slight cough nights between attacks
50	F	14	7	91		97	
51	F	12	11	108	88		Coughs nights
55	M	10	5	100			Frequent periodic attacks
62	M	10	7	70			Chronic cough
67	M	8	½	108	108	115	
72	M	10	5	110			
73	M	10	8	85			
77	M	10	3	96			
82	M	9	5	108			Slight cough
86	M	16	13	100	99	101	Attacks only at long intervals
Average		10.9	6.5	97.8	92.1	103.6	

grade emphysema. Another possibility is that a chronic cough in these cases may perhaps actually represent a mild form of asthmatic attack.

Many cases had numerous serial readings which are not shown in these tables. In general, these readings were a measure of the condition or progress of the individual. Frequent attacks reduced the vital capacity, and diminution of frequency of attacks increased the capacity. The figures immediately after attacks were considerably lower in most cases than after a longer interval had elapsed. The vital capacity apparently showed no constant relation to the total duration of the asthma.

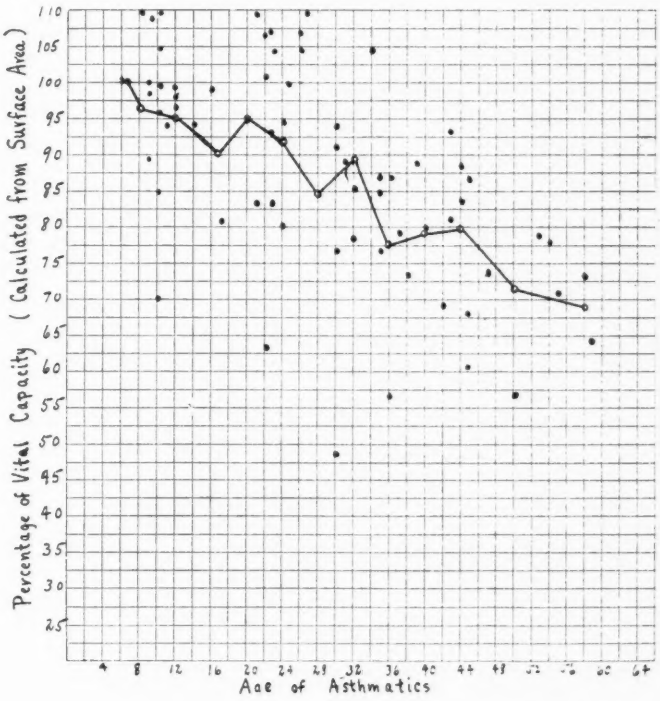

Fig. 1.

The prognosis of bronchial asthma in the individual case usually depends on the success with which one may remove or treat the specific factor. However, it must be realized that in many instances complications such as emphysema, chronic bronchitis, bronchiectasis and cardiac changes prevent complete recovery. It is in these particular cases in which vital capacity determinations have been of greatest value. Although the number of cases observed is limited and although the period over which these observations have been made is not very long, it is quite evident from the observations at hand that a marked reduction in vital capacity between attacks denotes a poor prognosis for complete recovery.

SUMMARY, TABLE IV

VITAL CAPACITY IN BRONCHIAL ASTHMA

	NO. OF CASES	AGE	DURATION YEARS	PER CENT NORMAL V. C.
During attacks:		37.4	8.75	
Tightness in chest	6			73.5
Moderate asthma	27			60.5
Fairly severe asthma	5			41.4
Between attacks:				
Adults (16 yr. or over)	48	35.5	7.5	82.3
Children (under 16 yr.)	15	10.9	6.5	97.8
With chronic cough:				
(11 adults, 4 children)	15	37.8	7.2	72.3

SUMMARY

This report concerns a study of the vital capacity in 88 cases of bronchial asthma under varying conditions. There was a diminution in the capacity during the attack proportional to the severity of the latter. The average vital capacity between attacks was considerably decreased in adults but very little altered in children. This may be interpreted as a greater tendency to complications in adults. Although the nature of this tendency has not been definitely ascertained it is thought that emphysema is the most likely possibility. The presence of a chronic cough diminished the vital capacity still further. These and other observations seem to indicate that vital capacity determinations may be employed to great advantage in bronchial asthma to determine the progress and prognosis due to complications. This study also shows that bronchial asthma is frequently capable of producing permanent and organic changes, especially in adults, sufficiently marked to be discernible by vital capacity tests. It is suggested that bronchial asthma with its resultant complications is a disabling ailment more frequently than is ordinarily assumed.

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ALLERGIC ECZEMA*

Based on the Study of One Hundred Eighty-One Cases

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BY NO means are all cases of eczema due to hypersensitiveness to foreign protein, but it appears to be the sole cause or a contributing factor in many. The medical profession is just beginning to recognize the important rôle that food sensitivity, and sensitization to other proteins, play in the cause of eczema. Whether we consider eczema as a unitary disease or as a pathologic skin reaction due to a variety of local or constitutional disturbances, the fact remains, as pointed out by Vaughan, that symptoms may be relieved following the application of several widely diverse measures. The dermatologist obtains good results in 30 to 40 per cent of the cases of eczema with the use of the x-ray or through local applications; the pediatrician relieves about the same number of children who suffer, by manipulation of carbohydrates and proteins in the diet; but there is at least a third or more who do not respond to such measures. Many of these cases are hypersensitive to food or drugs and on removing the food from their diet or prohibiting the drugs to which they are specifically sensitive, their symptoms disappear, frequently in a very short time. Foods that cause eczema are usually common ones, such as wheat, eggs, and milk, but eczema may be due to any food and it is frequently a combination of a sensitivity to many.

The patients with eczema who come to our Clinic for study very frequently come under the class of those who did not get good results with the dermatologist or those who did not receive relief from the food manipulation by the pediatrician. Our study of the subject of eczema from an allergic standpoint is based on 181 patients, whose ages range from one month to eighty years. All were private cases, practically all American born, and at least 75 per cent have been under our observation over six months. There were 95, or 52.5 per cent, males, and 86, or 47.5 per cent, females. It appears that the male and female are afflicted alike. The onset of symptoms occurred in 48, or 26.5 per cent, during the first decade; in 20, or 11.1 per cent, in the second; in 26, or 14.3 per cent, in the third; in 30, or 16.6 per cent, in the fourth; in 26, or 14.3 per cent, in the fifth; and in 31, or 17.1 per cent, between the ages of fifty and eighty. The patients consisted of lawyers,

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doctors, oil workers, teachers, bakers, etc., in fact, individuals from all walks of life, and the children studied came from families of rich and poor alike.

THE HEREDITARY FACTOR IN ECZEMA

Most investigators of eczema consider heredity to play a minor part in the production of the syndrome. Of the 181 cases we have studied, 22, or 12.3 per cent, gave a bilateral family history of allergy, and 117, or 64.3 per cent, gave a unilateral history of allergy. In other words, 76.6 per cent were patients with a familial history. We must therefore conclude, from these figures, that the hereditary factor is an important one. Clinically the predisposing factor in many cases of eczema is a

TABLE I

CASES	48	20	26	30	26	18	10	3	TOTAL SERIES OF 181 CASES	PER CENT IN SERIES
YEARS	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80		
Male	29	17	6	12	14	10	6	1	95	52.5
Female	19	3	20	18	12	8	4	2	86	47.5
Bilateral Family History	10	2	5	4	1	0	0	0	22	12.3
Unilateral Family History	33	15	15	15	17	10	9	3	117	64.3
Negative Family History	5	3	6	11	8	8	1	0	42	23.3

Occurrence of positive family history of allergy, based on the study of 181 cases of eczema.

specific sensitivity to food. Biologically, in the linkage, eczema is interchangeable with asthma, hay fever, urticaria, and migraine. The hereditary predisposition frequently seen tends to strengthen the clinical findings that protein sensitization plays a definite part in the cause of many cases of eczema. It need not be assumed, as is frequently believed, that the hereditary factor must be eczema itself. It has been our experience that it is only one of a number of symptom complexes which are metamorphosed in passing from parent to offspring and arise in different forms in different members of the family. For example, it is so common for a patient who has eczema to give a history that his father has asthma, migraine, or hay fever. As has been previously mentioned, one inherits only the ability to become specifically sensitive and may become sensitive to egg protein and have eczema, or become sensitive to egg protein and from that sensitivity have urticaria or asthma.

EXCITING FACTORS

Our study of the eczema problem has assured us that eczema of all ages is often associated with sensitization to one or several foreign proteins and may be wholly or partially relieved by avoidance of contact.

Of 181 cases studied, 120, or 66.3 per cent, gave a very positive reaction to foods. Table II will show the positive food and inhalant proteins to which the patients were found sensitive. Like migraine and

TABLE II

POSITIVE REACTION	NO. OF CASES	PER CENT	POSITIVE REACTION	NO. OF CASES	PER CENT
Foods:			*Foods:*		
Wheat	90	49.8	Strawberry	17	9.3
Barley	41	22.6	Cherry	15	8.2
Rye	40	22.0	Fig	15	8.2
Buckwheat	30	16.5	Raisin	15	8.2
Corn	19	10.4	Plum	15	8.2
Milk			Banana	14	7.7
Cow's	67	37.0	Raspberry	14	7.7
Goat's	21	11.6	Prune	13	7.1
Human	2	1.1	Apricot	10	5.5
Lima beans	50	27.6	Tuna fish	31	17.1
Eggplant	48	26.5	Crab	28	15.4
Asparagus	47	25.9	Lobster	26	14.6
Beans	47	25.9	Smelts	18	9.9
String beans	44	24.3	Oyster	17	9.3
Radish	44	24.3	Clam	13	7.1
Turnip	43	23.7	Scallop	12	6.5
Kidney bean	40	22.0	Shrimp	11	6.0
Celery	39	21.5	Trout	10	5.5
Lettuce	38	20.9	Rabbit	27	14.3
Soy beans	38	20.9	Pork	19	10.4
Spinach	36	19.8	Turkey	15	8.2
Squash	34	18.7	Duck	12	6.5
Onions	34	18.7	Chicken	14	7.7
Carrots	33	18.2	Beef	11	6.0
Tomatoes	33	18.2	Veal	12	6.5
Blackeyed peas	32	17.6	Cheese	50	27.6
Cauliflower	31	17.1	Garlic	30	16.5
Lentil	31	17.1	Peanut	25	13.8
Red and green pepper	31	17.1	Coffee	22	12.1
Parsnips	29	16.0	Cottonseed	18	9.9
Cabbage	29	16.0	Tobacco	16	8.8
Beets	28	15.4	Tea	16	8.8
Artichokes	26	14.3	Black pepper	15	8.2
Potato	25	13.8	Chestnut	14	7.7
Sweet potato	23	12.7	Casein	15	8.2
Peas	30	16.5	Filbert	15	8.2
Cucumber	19	10.4	Oats	15	8.2
Pumpkin	16	8.8	Brazil nut	13	7.1
Mushroom	20	11.0	Almond	13	7.1
Parsley	14	7.7	Flaxseed	13	7.1
Orange	30	16.5	Rice	10	5.5
Pineapple	28	15.4	Cocoa	11	6.0
Grapefruit	25	13.8	Hickory nut	11	6.0
Lemon	25	13.8			
Pear	23	12.7	*Inhalants:*		
Rhubarb	21	11.6	Ragweeds	105	58.0
Peach	19	10.4	Grasses	85	46.9
Cantaloupe	19	10.4	Amaranths	78	43.0
Watermelon	18	9.9	Animal dander	140	77.3
Grape	17	9.3	Dust	78	43.0
Blackberry	17	9.3	Orris root	55	30.3
Apple	16	8.8	Silk	18	9.9

Occurrence of scratch and intradermal reactions to the most common proteins used in testing 181 eczema cases.

urticaria, multiple sensitivity was found to be the rule. Wheat was positive in 90, or 49.8 per cent of the cases, and was considered the chief factor in 42, or 23.2 per cent. Milk was definitely positive in 67 cases, or 37.0 per cent, and was considered the chief factor in 33, or 18.2 per cent. More than three-fourths of all cases were found definitely sensitive to inhalants, including pollen and animal dander. Theoretically it should be this way, that is, a patient who has the ability to become specifically sensitive to food and have eczema, should also have a tendency to become sensitive to inhalant proteins, and frequently they do.

In some sections of the United States pollen is an important factor in the cause of seasonal eczema. Of 102 allergic eczema cases studied by us some months ago, pollen appeared to be the primary factor in 7, or 6.8 per cent, and a secondary factor in 13, or 12.7 per cent. In other words, pollen was either a primary or a secondary factor in 20, or 19.5 per cent. This percentage appears high, but these patients have been studied rather carefully and a number of them studied over a period of two seasons. Throughout the great Southwestern territory pollen should be carefully considered as an exciting factor in summer eczema. In other sections of the United States it is not quite so important but should always be thought of as a possible exciting factor.

External irritants other than pollen are not uncommon. The fine hair-like material on various plants will occasionally cause eczema. The evening primrose, the tomato plant, the hollyhock, and others, will cause eczema in some cases. Although eczema may be due to a specific sensitization to the fine hair-like material on plants, and the pollen of some plants, yet the great majority of eczema due to a specific sensitization is from ingested food protein.

It is difficult for patients and likewise for doctors to understand why one may be perfectly free from eczema for a time and then while on practically the same diet suffer from it. In typical allergic eczema this actually happens. The same thing, however, is true in the typical hay fever or asthma patients. For example, a child may have asthma due entirely to feathers and yet attacks of asthma will appear only every week, every two weeks, two months, or at longer intervals, although he sleeps on feather pillows each night. Vaughan suggests as an explanation that the chemistry of the body may be in a state of "allergic equilibrium" or "balanced allergic state" when the patient remains free from asthma while sleeping on feathers, to which he is specifically sensitive, or remains free from eczema while eating the food proteins to which he is extremely sensitive. At times the allergic state becomes unbalanced, due to various predisposing factors, and at that time the patient might develop asthma or eczema. For example, a child might sleep on feathers, to which he is specifically sensitive, night after night and have no difficulty, yet following a day that he had sat on the cold

ground or had overeaten, or was extremely constipated, he would develop a typical attack of asthma. Again, a child or an adult might remain perfectly free from eczema while on a diet consisting of one or more foods to which he is specifically sensitive, but on the following day when other foods to which he is specifically sensitive would also be added to the diet, or he would be constipated, or there would be some mechanical irritation on the skin, such as the collar rubbing the neck, or the cold air irritating the hands and face, eczema would appear. In many cases of eczema an overdose of the same protein food might disturb the balance with consequent precipitation of symptoms. For example, one might daily ingest a quantity of milk, to which he is sensitized, without symptoms, but when he adds cheese, or large quantities of milk, allergic eczema symptoms appear.

PREDISPOSING FACTORS

Conditions which play a part as predisposing factors are as follows:

1. Local irritation of the skin.
2. Thyroid dysfunction.
3. Focal infections.
4. Toxic absorption from constipation.
5. Nervousness.
6. Chemical irritation.
7. Actinic and thermal irritation.

We have observed a number of patients who were extremely sensitive to food protein but would remain entirely free from symptoms except at times when there would be local skin irritation from clothing or a hat band. Decreased secretion of the thyroid gland will change the functions of the body in some way, probably upsetting the "allergic equilibrium," so that the foods to which the patient is specifically sensitive will precipitate eczema. This is not very uncommon. A number of allergic eczema cases have been studied who did remain free from symptoms after focal infections were cleared away. However, this does not mean that sensitization to foods was not the exciting factor.

It appears from our study that the allergic eczema patients have more difficulty during periods in which they are troubled with constipation, therefore it seems logical that there may be an absorption of toxins through the colon, which changes the "allergic equilibrium" in some way. We have studied ten patients in whom it appeared quite conclusive that a state of mental fatigue or marked nervousness played a part as a predisposing factor in their eczema. Many apparently innocent substances are provocative of occupational eczema; for example, butcher's eczema, due to cold brine; surgeon's or nurse's eczema, due to formaldehyde, mercuric chloride, novocain, or butyn; or paper hanger's or photographer's eczema, due to various pastes and chemical

agents. Those who work with the x-ray or who are given frequent exposures for treatment will not uncommonly develop eczema from the actinic ray. Blacksmiths and stokers have eczema due to the effect of thermal irritation. There are many other factors which might act in a predisposing way in allergic eczema.

SYMPTOMATOLOGY

Eczema of the asthma-hay fever complex type has no definite characteristics that will distinguish it from eczema or a dermatitis of any other source. However, in a large percentage of the allergic eczemas the face is involved, especially the forehead and the skin about the mouth and chin. The face is involved more often in children than in

TABLE III

AGE	EXTREMITIES PER CENT	TRUNK PER CENT	HEAD AND NECK PER CENT
1 mo.-5 yr.	52	47	82
5 yr.-10 yr.	50	25	41
10 yr.-20 yr.	75	50	50
20 yr.-30 yr.	41	52	52
30 yr.-40 yr.	80	28	47
40 yr.-50 yr.	77	27	50
50 yr.-60 yr.	61	69	38
60 yr.-80 yr.	100	55	33

Distribution of lesions according to age, based on the study of 181 cases of eczema.

adults. The flexures of the elbows and the popliteal spaces frequently are dry and thickened in type, often excoriated by scratching. The rash, at times, practically will clear away, and from some unknown cause will burst into exacerbations which may convert the face into a shapeless and oozing mass, with slits for eyes and mouth; the scalp hair gummed with sticky exudate having a sickening sweetish odor, the ears swollen and dripping, the neck disfigured, and the arms and legs furiously itching and torn. The symptoms due to eczema differ to some extent, depending on the part of the body involved. The itching sensation is a symptom common to all types. However, it is very much more prominent in some cases than others. In our series the head and neck were involved in 82 per cent. In adults the necks, arms, breasts, genitals, palms of the hands, and legs, are common areas involved. Between the ages of fifty and sixty only 38 per cent had symptoms on the head and neck. This is an interesting contrast to the infants. Infantile eczema is often acute or subacute in character. The cheeks are frequently flushed, and the eczema areas ooze. Rubbing and scratching the areas materially accentuates symptoms. Children usually cannot resist the temptation to scratch. At night hands frequently have to be tied, or other methods for preventing scratching used. Eczema in the adult may be of the acute weeping type, but very commonly is of

the chronic dry type and has a tendency to persist over long periods of time. Even adults will often scratch the areas during their sleep and by so doing many times will break the skin, allowing infections to occur.

CASE REPORTS

The following case reports typify the allergic eczema we have studied.

CASE 1.—A boy, aged twenty-two months, was brought to us with a complaint of weeping eczema on the face and hands since he was eight months of age. When it first occurred it was mild, but at sixteen months of age it became very severe.

The maternal grandmother has migraine and the mother has light attacks of perennial hay fever.

Skin testing revealed the following:

Eggs	++++
Wheat	+++
Squash	++
Peas	++
Oats	++

The foods to which he was sensitive were removed from his diet, with complete freedom from his eczema, and he has remained free except for two or three times when the mother broke over and gave him cream of wheat. She soon learned that wheat products would bring on his old trouble.

Discussion.—It is interesting to note that his trouble started at eight months of age, at the time wheat products were added to his diet, and that it became very severe at the time the pediatrician added eggs. Eggs and wheat were both factors in the cause of symptoms. This patient has been observed for a period of about one year. In all probability, if eggs and wheat are kept out of the diet fairly well he will obtain enough of both of these products in various ways during the next four to six years to automatically desensitize himself, and will be able to take them when he is eight or ten years of age without difficulty.

CASE 2.—A girl was brought to us at six months of age with a history of eczema of a very severe type since she was two months old. Her body was literally covered with weeping eczema. A small area of the back was the only portion on which skin testing could be done. She was found sensitive to the following proteins:

Whole wheat	++++
Wheat proteose	++++
Wheat gliadin	+
Wheat leucosin	++
Wheat globulin	++++

All other foods negative.

At the time she was seen by us her diet consisted of modified cow's milk. We learned on inquiry that the cows were fed chiefly on bran. Her diet was changed to milk from cows fed on green wheat pasture, with freedom from symptoms.

Discussion.—The question as to how this child was receiving wheat is an interesting one. There is but one answer, namely, the wheat protein came through the lacteals of the cow's udder, and therefore was a constituent of the milk. The change which was made and the results obtained are excellent evidence in favor of this supposition. When first seen, we informed the mother that this child some day would probably develop asthma, inasmuch as a child born with the ability to become specifically sensitive to wheat early in life would have great probabilities of developing a sensitivity to inhalants and develop asthma. This she did.

CASE 3.—A girl, aged five, was brought to us for her asthma, which she had had since she was two years of age, and on taking her history we found that she had had eczema in a very severe form since six months of age.

Her mother had asthma, her father had eczema, one sister had hay fever, and one maternal aunt had hay fever.

The severity of the asthmatic attacks necessitated some relief. The eczema had been of such long standing that the mother said little concerning it. On preparing to test her we found that the eczema was so marked over the body we had difficulty in finding a space for work. She also gave a history of hives, very severe at times, and she was a nose rubber.

On testing her we found her extremely sensitive to the following proteins:

Egg whole	++++
Egg yolk	++++
Egg white	++++
Ovomucoid	++++
Barley	++
Rye	++
Beans	++++
Lima beans	++++
Kidney beans	++
Tomato	++
Radish	++
Cocoanut	++
Brazil nut	+++
Filbert	+++
Silk	++++
Turkey meat	++
Peanuts	++++

Duck feathers	+++
Chicken feathers	+++
Goose feathers	++
Pollens all negative.	

Feathers were entirely removed from the home, and the foods to which she was specifically sensitive were taken out of her diet, with absolute freedom from her nasal irritation which caused her to be a nose rubber, and freedom from her asthma. With these foods out of her diet her eczema gradually disappeared, requiring about nine months, but today her skin, which at one time was alligator in type, is now smooth and soft. She is in school and doing extremely well.

Discussion.—This patient illustrates the type which we frequently see, namely, manifesting more than one type of allergy. There is a bilateral family history. In patients with a bilateral family history there is a greater tendency for the symptoms to appear early in life and for multiple manifestations to occur. From the time this child was six months of age until we saw her she had not slept a single night without having her hands tied. She was a source of great worry to the family. The eczema, hives, and asthma were of sufficient severity to keep her from entering school, and therefore would seriously interfere with her life. It has been our experience that in the allergic eczemas the prognosis in the severe cases, so far as complete recovery is concerned, is just as good as in those whose symptoms are mild.

Case 4.—A man, aged thirty-two, came to the Clinic complaining of eczema since a small child, and asthma severe during the last four years. His occupation was that of night clerk in a small hotel. He said that he had never been able to do ordinary work on account of the appearance of his face. For ten years his arms and legs had been bandaged on account of a weeping eczema. He had consulted a number of skin specialists throughout the country, and various treatments had been applied, but no one had tested him for sensitivity to food.

He gave a family history that one brother had asthma, one sister had eczema, his mother had migraine, and maternal grandmother had asthma.

He was found sensitive to the following foods:

Wheat	++
Lima beans	++
Kidney beans	++++
Blackeyed peas	++++
Soy beans	+++
Tomatoes	++
Peas	++
Turnips	++
Cabbage	++

Cauliflower	++
Onions	+
Peanuts	++++
Hickory nuts	++
Coffee	++
Goose feathers	+++
Chicken feathers	+++
Duck feathers	+++

Feathers were removed from his home, and he was placed on a strict diet, eliminating the foods to which he was specifically sensitive, with complete freedom from his asthma. In two months' time the only eczema which still remained on his body was on his neck, and forehead where the sweat band of the hat rubs. He is now able to carry on a gainful occupation and support his wife and child, which he had previously not been able to do.

Discussion.—This patient is very interesting from an allergic standpoint, since he has a definite history of allergy in the family and a history of asthma himself, besides the eczema about which he came to us complaining. When such a history is given surely in 100 per cent of the cases testing and retesting for a possible cause of the eczema is indicated.

CASE 5.—A male, aged forty-two, a supervisor for a telephone company, complained of seasonal eczema during the past fourteen years; hay fever for the past two years.

Maternal grandmother had eczema, mother had eczema, brother has eczema, one brother had hay fever and migraine, one daughter has asthma.

He told us that his eczema never disturbed him except from July 10 until frost, and that it would be so severe that his face would be swollen most of the time, many times to the extent that he was unable to work, on account of the difficulty in seeing, due to the swelling of the tissue about the eyes, but that at frost his symptoms would entirely disappear. He came from the Russian thistle district of Texas.

On our first examination his face was covered with eczema of the weeping type; his eyes were badly swollen, and he was wearing house slippers on account of the eczema and the swelling of his feet. An infection was superimposed on the eczema of the feet.

On testing him we found him sensitive to no foods, but very sensitive to Russian thistle. Desensitizing to Russian thistle was attempted, but without relief. Upon our advice his company transferred him to a nonRussian thistle district, with complete relief from his symptoms.

Discussion.—This patient illustrates a severe type of allergic eczema due to pollen, in which difficulty is encountered when desensitizing is tried. In some cases of eczema the use of the pollen extract apparently

increases the eczema, therefore it must be discontinued. The only solution in such a case is to have the individual live in a territory in which the plant does not grow.

CASE 6.—A merchant, forty-five years of age, came to the Clinic complaining of a type of eczema which simulates the nettle rash type of urticaria. He also had hay fever during the fall of the year. Both his hay fever and eczema had existed over a period of eleven years. During the winter there was a generalized itching of the body from time to time, and during the summer from August 15 until frost the itching was very marked. In the fall of the year the eczema was most severe on the exposed portions of the body.

On testing we found him sensitive to the following proteins:

Coffee	++
Cocoa	++
Pork	+++
Wheat	+++
Cantaloupe	++
Watermelon	++
Cat hair	++
Dog hair	++
Duck feathers	+++
Goose feathers	++
Chicken feathers	++
Giant ragweed	+++
Short ragweed	++
Western ragweed	++

The foods to which this patient was found sensitive were removed from his diet. Feathers and the animal dander to which he was sensitive were eliminated from his home, and he has been held desensitized to a mixture of the three ragweeds for the past two years. Such a procedure has given this man complete relief from his eczema and hay fever.

Discussion.—This man illustrates a type of allergic eczema which is not uncommon, namely, one whose eczema is not only due to food but also complicated with a sensitivity to animal dander and pollen, which play a definite part in the cause of the skin rash. This man had gone many places over the United States seeking relief from his eczema, and when he came to us was more or less of a neurotic type, disgusted with medical care.

GENERAL HEALTH OF ECZEMA PATIENTS

In our study of allergic eczema we have been impressed with the fact that their general health is above normal. The typical allergic eczema child is one who is normal in weight, or above normal, and other than his eczema, and in some cases abdominal discomfort, the mother reports

that the child has had but little difficulty. We have seen practically no cases of allergic eczema in the Indian. This finding is likewise true of asthma, migraine, urticaria, and hay fever.

METHODS OF DETERMINING THE EXCITING FACTORS

The technic of the sensitization tests is similar to that employed in bronchial asthma, hay fever, urticaria, and migraine. Both the scratch method and the intradermal must be employed. The tests are read after a half hour, four hours, and after twenty-four hours. Delayed reactions in some cases are very important. The reactions in eczema, especially the delayed ones, require considerable experience if correctly read. Many very mild reactions are important ones. In some cases the twenty-four hour reading is nothing more than a slight scaly patch of eczema. The immediate readings in many cases are similar to those found in hay fever, asthma, and urticaria, but there is a tendency for the reaction to be milder and partake more of the generalized character of the delayed reaction. The reaction is not uncommonly a turgescent papule surrounded by an erythematous zone of varying degree.

Many physicians, including the dermatologist and the pediatrician, have attempted the study and treatment of allergic eczema but have discontinued its use, and I am inclined to believe that they discontinued their study not because it was incorrect in principle but because their interpretation of positive and negative tests was wrong, or their methods of eliminating positive foods from the diet were not well done.

PROGNOSIS

Some cases of allergic eczema in children will automatically desensitize themselves to food and clear up, but the average case will run a course of mild to severe eczema over a period of several months to a few years. A great many of these children who are sensitive to food will develop asthma, due to food sensitivity. Many of these patients also have bowel upsets and a certain amount of abdominal pain due to the food sensitivity. Therefore it is of greatest importance that these patients be carefully tested for the foods to which they are sensitive and the offending foods eliminated. There is a tendency for allergic eczema in adult life to be more chronic than in childhood. They frequently contend with their eczema over a period of many years. The disease both in the child and the adult seldom and probably never in itself takes life, but the discomfort to the patient and family is great. If the proteins to which the adult is sensitive are found and eliminated, relief can be hoped for.

TREATMENT

Treatment of allergic eczema consists of thorough elimination of all foods to which the patient is specifically sensitive, and in many cases the elimination of other foods that experience has taught are common

offenders. Some cases of course are due entirely to pollen or external irritants of various sorts. In these cases thorough elimination of the external irritant is in order. Many cases are a combination of a specific sensitivity to food and to external irritants. In such cases one must not lose sight of the importance of thorough elimination of both, and in some cases, desensitizing, as, for example, those whose eczema is partially or entirely due to pollen. In some cases it is impossible to find the offending food by testing, which requires us to resort to the second part of the process of eliminating foods, namely, dietary manipulation. In advising patients concerning the elimination of foods one must use the greatest care. In the first place, the patient who is very sensitive to food may develop eczema if the minutest particles of that food protein remain in the diet. Therefore in eliminating wheat from the diet, one must be sure that wheat and all wheat products are removed. For example, we have a patient so sensitive to wheat that a piece of bread the size of a grain of wheat would cause marked symptoms of eczema in a few hours' time. Another patient under our care at the present time will develop eczema when an extremely small amount of egg is ingested. In outlining diets for patients suffering from allergic eczema, one should be careful to see that the foods remaining in the diet make up a well-rounded one. As in the treatment of urticaria and migraine, there should always be in the diet each twenty-four hours, two cereals, either cooked or raw; two vegetables, either cooked or raw; two fruits, either cooked or raw; and two meats. Eggs and fish are included under the heading of meats. In the majority of cases the treatment of allergic eczema is very satisfactory.

While by no means are all cases of eczema allergic, yet from my observations it appears that in at least one-third of the cases a protein sensitization is the exciting factor. Since it is absolutely impossible to tell from observing the patient which case is allergic and which one is not, one is justified in testing any case of eczema. It is our opinion that 100 per cent of the cases of eczema that give a family history of allergy by all means should be carefully tested and retested for protein sensitization, as it is the most probable etiologic factor.

THE DISAPPEARANCE TIME OF CIRCULATING RAGWEED POLLEN MATERIAL AFTER ABSORPTION FROM THE NOSE AND THROAT*

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A YEAR ago we reported that nonallergic people absorb ragweed pollen material from the nose and throat with great rapidity.[1] In a series of 50 such individuals a reaction was obtained in an area of skin passively sensitized to ragweed allergen, within fifteen to thirty-one minutes after the pollen was sprayed into the nostrils. Much to our surprise, allergic patients, not sensitive to ragweed, had a markedly delayed reaction time. In 15 such individuals the time varied from a positive reaction in forty-seven minutes to no reaction in two hours. These observations caused us to revise some of our ideas concerning the permeability of the mucous membranes in allergic individuals since the findings were the reverse of those commonly accepted to be true, and opened up a new method of approach to some of the fundamental problems of allergy.

Since the amount of ragweed allergen circulating through the capillaries of a passively sensitized area within thirty minutes following its contact with the nose and throat must be extremely small, and since the reactions obtained with the reagin containing serum were so characteristic, it seemed to us that we had a very accurate immunologic method for the demonstration of small amounts of circulating allergen. It also seemed advisable to determine for how long a period ragweed allergen remained in the circulation after nasal absorption once its presence was demonstrated.

Accordingly, the following technic was carried out in a series of 10 nonallergic people. An area of normal skin was sensitized with the plasma of patient, S.C. Twenty-four hours later a mixture of equal parts of giant and short ragweed pollen was sprayed into each nostril by means of a hand powder blower. The sensitized area was observed for the appearance of a reaction, which occurred in all subjects. Thus the presence of pollen allergen in the circulation was demonstrated. Each twenty-four hours thereafter for three days, a new site was injected with plasma, S.C. At the end of the fourth day, the nose was resprayed with pollen and all injected areas were observed for reaction.

*From The Institute of Pathology, Western Reserve University.

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In every case area No. 1 which had reacted to prove the presence of circulating pollen material failed to react following the second introduction of pollen through the nose. This was true also, in eight of the cases, of area No. 2 which was sensitized twenty-four hours later. Areas No. 3 and 4 gave a characteristic reaction in all. We interpreted these findings to indicate that the circulating antigen had exhausted the injected atopen in the areas not reacting. Therefore, we concluded that there was sufficient allergen circulating for twenty-four hours following absorption from the nose and throat to exhaust the reagin from passively sensitized areas in 80 per cent of normal individuals.

SUMMARY

By means of a modification of the Prausnitz Küstner reaction,[2] attempt was made to measure the disappearance time of circulating ragweed pollen material after absorption from the nose and throat. In eight out of ten nonallergics, the allergen could be demonstrated to be present for twenty-four hours. In no case was there any demonstrable at the the end of forty-eight hours.

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FOOD ALLERGY AND POLLEN HAY FEVER*

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FOOD allergy is recognized as a cause of perennial hay fever, gastrointestinal symptoms, headache, urticaria, angioneurotic edema, eczema, bronchial asthma, bronchitis, and as a less frequent cause of bladder distress and certain other manifestations.[1] I wish to emphasize in this paper that patients suffering with pollen hay fever rather frequently have concomitant food sensitizations which may not only intensify the nasal symptoms but may produce any of the other manifestations enumerated above. The necessity of recognizing all types of allergies in order to obtain satisfactory control of the nasal symptoms has been pointed out by Eyermann,[2] Vaughan,[3] Balyeat,[4] Cohen and Rudolph,[5] and Gelfand,[6] but emphasis on the importance of the study of the patient's history and of his skin reactions to be sure that food allergy is not producing other manifestations during the pollen season as well as at other times of the year, has not been stressed heretofore.

For statistical purposes, the records of 50 consecutive patients whose main complaint was seasonal hay fever and who have been tested completely with all types of allergens have been reviewed. Certain patients with definite seasonal hay fever have objected to complete examinations and testing even though I have emphasized their importance, and their histories have indicated possible digestive, cutaneous, or other disturbances due to food or other allergens. Patients were first tested cutaneously and then intradermally with all important allergens to which reactions had not occurred. No questionable or delayed reactions are tabulated although I feel they cast suspicion on the indicated allergens.

The record of the skin reactions in these cases indicates the frequency with which positive reactions to animal emanations, house dusts, orris root, and miscellaneous substances, such as cottonseed, flaxseed, kapok, and pyrethrum occur in patients reacting primarily to pollen allergens. When the one-plus as well as the larger reactions are counted together, the number of patients giving such reactions is large, indicating the importance of such routine testing.

A history of perennial nasal congestion occurred in 50 per cent of these patients suffering with pollen hay fever. In such patients especially, as well as in those patients in whom pollen therapy is not productive of satisfactory control of the seasonal symptoms, it is important to take other inhalant allergens as well as those of food into account.

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The occurrence of negative reactions to various allergens including pollens as emphasized by Peshkin and Kahn must be remembered. The tendency for patients to react to more than one type of pollen and

TABLE I

CLINICAL DATA ON 50 CASES OF POLLEN HAY FEVER

Male		14
Female		36
Seasonal		50
Perennial		25
History of		
Pollen		50
Dust		21
Animal emanation		7
Food		16
Powder		7
Associated conditions		
Asthma		22
Bronchitis		7
Gastrointestinal	Pyrosis and belching	25
	Nausea or vomiting	6
	Canker sores	1
	Pain, upper right abdomen	2
	Diffuse	2
	Lower	1
	Diarrhea	2
	Constipation	13
	Mucous colitis	0
	Pruritus ani	0
Urticaria		11
Angioneurotic edema		0
Eczema		9
Allergic		
Migraine or headaches		20
Dizziness		3
Toxemia		2
Bladder Distress		1
Family history		
Hay fever		8
Asthma		21
Bronchitis		4
Catarrh		4
Eczema or hives		8
Headaches		2
Operations		
Tonsillectomy		27
Nasal		12
Sinus		3
Appendectomy		10
Gall bladder		1

especially the frequency of reactions to cultivated flower pollens indicates the necessity of testing patients with all types of pollens.

Food reactions occurred in 40 patients in this series. Of the ten patients who did not react, 7 gave a history of one or more food disagreements. Such history frequently indicates a food allergy. Wheat,

TABLE II

SKIN REACTIONS TO ALL TYPES OF ALLERGENS IN 50 PATIENTS WITH SEASONAL HAY FEVER

	1+	2+ OR LARGER	TOTAL
Animal emanations	18	18	36
House dusts	23	13	36
Orris root	11	5	16
Miscellaneous	11	5	16
Tree pollen	11	24	35
Grass pollen	7	36	43
Fall pollen	11	27	38
Flower pollen	7	32	39
Food Reactions			
Wheat	9	6	15
Corn	5	3	8
Oats	5	0	5
Rice	2	2	4
Barley	1	1	2
Buckwheat	1	2	3
Rye	1	1	2
Egg	1	4	5
Milk	5	1	6
Chicken	1	0	1
Vegetables			
Artichoke	4	1	5
Asparagus	6	1	7
Carrot	1	0	1
Cauliflower	7	2	9
Cabbage	5	4	9
Celery	5	3	8
Lettuce	6	1	7
Navy bean	3	0	3
Onion	8	1	9
White potato	2	2	4
Sweet potato	3	0	3
Parsley	3	0	3
Parsnip	1	2	3
Pea	1	1	2
Food Reactions, continued			
Vegetables, continued			
Radish	3	0	3
Squash	6	2	8
Spinach	8	4	12
String bean	7	2	9
Sprouts	1	0	1
Tomato	7	2	9
Turnip	7	2	9
Fruits			
Apricot	5	0	5
Apple	1	0	1
Banana	0	1	1
Cantaloupe	6	1	7
Grape	2	0	2
Fig	2	0	2
Peach	2	1	3
Pineapple	0	1	1
Plum	4	0	4
Orange	4	1	5
Raspberry	1	0	1
Strawberry	1	0	1
Watermelon	2	1	3
Miscellaneous			
Cocoa	3	0	3
Coffee	3	0	3
Tea	1	1	2
Almond	3	0	3
Cocoanut	1	0	1
Peanut	2	0	2
Walnut	1	0	1
Vanilla	1	0	1
Black pepper	3	2	5
Crab	1	0	1

Total 1-plus reactions to foods 174
Total 2-plus or larger reactions to foods 60

It is interesting that definite idiosyncrasies to the following foods were appreciated by patients who gave no corresponding skin reactions: 4 to wheat, 3 to egg, 4 to milk, 1 to asparagus, 1 to cabbage, 1 to cucumber, 1 to squash, 2 to onion, 1 to pea, 2 to turnip, 2 to apple, 4 to banana, 2 to cantaloupe, 3 to orange, 7 to strawberry, 2 to chocolate, 2 to honey.

egg, cabbage, spinach, celery, and corn gave from 3 to 6 reactions larger than one-plus in size. Histories of disagreements to 42 foods in the absence of corresponding skin reactions occurred in 20 different patients and to 8 foods in the presence of corresponding skin reactions. This stresses the fact that food reactions are frequently negative when specific food allergies are present. The one-plus reactions to foods were usually ignored except when a history of specific idiosynerasy occurred or a manifestation which might be due to food allergy required control. As with all types of skin reactions, those due to food frequently indicate potential allergy in the absence of clinical manifestations of such sensitization.

As stated before, my desire in this paper is to emphasize the occurrence of conditions other than nasal which may be due to food allergy in patients with pollen hay fever. In this series, however, food was considered as a complicating cause of nasal congestion in 8 per cent of the patients. It was felt that food allergy entered into the etiology of the bronchial asthma in 13 of the 22 patients so afflicted. Of the 25 patients having pyrosis and belching, 20 had definite histories of food disagreements and 22 gave one or more food reactions. Of the 20 patients complaining of recurrent headache, I felt that food was causative in 15 cases. Histories of food disagreements occurred in 13 of these 15 patients and 12 gave one or more food reactions. My records are not definite in regard to relief from constipation, though I feel that in patients with such marked allergic tendencies, it is probable that colonic spasm due to food allergy was present in certain cases. The frequency of other cutaneous and gastrointestinal symptoms which are often due to food allergy, as I have previously reported,[7] is tabulated. The statistics on the family history and on operations performed on the patient are included for completeness and interest. Appendectomies had been performed for symptoms which were probably due to food allergy in several of the patients.

The control of indicated food sensitizations has been carried out by elimination of specific foods when skin reactions have been definite or when histories of food idiosyncrasies have been obvious or by the use of my elimination diets. These diets have been modified according to food reactions if such have been obtained or to any history of food disagreements.

To illustrate the occurrence of symptoms due to food allergy in patients suffering with pollen hay fever, the following cases are briefly summarized.

CASE 1.—A woman, aged thirty-five, had had seasonal hay fever for seventeen years. For twelve years she had had indigestion, nausea, and vomiting, and dysentery at frequent intervals. For one year the elimination of eggs and milk had given her relief. Frequent canker sores had persisted. Face powders and making beds made her sneeze. She gave large reactions to grass and locust pollens, and one-plus reactions to several cultivated flower and fall pollens as well as to orris root and spinach. She was treated with pollen extracts, given an orris-free powder and placed on my elimination diets, 1, 2, and 3, with complete relief of her hay fever, indigestion, and canker sores. She reports that wheat as well as eggs and milk and asparagus produce her digestive discomforts. Cleaning asparagus makes her sneeze.

CASE 2.—A man, aged forty-five, had had severe hay fever every spring for twenty years though nasal congestion and sneezing had recurred nearly every night throughout the year. Indigestion consisting of belching, bloating with associated headaches once or twice a

week had been present since his earliest memory. Three years ago his gall bladder and appendix were removed because of these digestive symptoms, with moderate relief resulting. He gave large reactions to many grass pollens and two-plus reactions to several cultivated flower and fall pollens. All other reactions were negative. He was given pollen therapy and because of his headaches and digestive symptoms, was placed on elimination diets 1 and 2. In ten days he reported complete relief from his digestive symptoms and headache and since then diet 3 as well as potatoes, butter, fish, oranges, and berries have been added. His hay fever has been well controlled by pollen therapy and his elimination diets have relieved him of his indigestion and headaches. His appetite is fine and he feels better than in years.

CONCLUSION

1. The allergist must study the patient complaining of seasonal hay fever from the point of view of sensitizations to other than pollen allergens.

2. Such patients often have food sensitizations that are productive of gastrointestinal symptoms, headaches, urticaria, eczema, asthma, and nasal congestion as well as other symptoms due to food allergy.

3. The control of such food allergies is facilitated by the use of the elimination method of diet trial which I have previously described.

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THE NATURE OF ALLERGY*

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WHEN the reaction to contact with foreign substances is abnormal and especially when it is active or perhaps violent, it is often referred to as an "allergic" reaction. Such a reaction implies a definite change in the animal which Von Pirquet in 1906[1] referred to by using the word "Reaktionsfähigkeit," to be translated as "reaction capacity." In using this word, Von Pirquet referred to the capacity of actively sensitized and artificially prepared animals to react when contact with the antigen was renewed.

Later "allergy" was used by Von Pirquet[2] to describe certain reactions of man to foreign substances. Since then, other authors[3] have implied that the individuals exhibiting these reactions were fundamentally different perhaps by heredity from normal persons. This conception of a fundamental difference was supposed to explain the occurrence of a "natural sensitiveness."

Further study has shown, however, that in an ever increasing proportion of the cases, the active acquisition of the sensitiveness is a very real possibility. Sensitization in man, as in the lower animals, can occur not only by way of the gastrointestinal tract and the respiratory tract, but it can take place through the placenta as well. In utero, active sensitization through the transfer of the unchanged antigen in the maternal circulation and passive sensitization through the transfer of maternal antibodies is recognized.[4] It seems proper, therefore, to assume that hypersensitiveness is acquired in most cases and probably in all. What we call "allergy" may well be nothing more than anaphylaxis in man.

The symptoms of allergy are interesting: the fact that they depend upon a characteristic and uniform pathology is important. Spasm of smooth muscle, stimulation of glands, increased permeability of capillaries are produced with such uniformity as to justify the conception of a common end-product which results from a great variety of reactions. These reactions in turn depend upon the presence of fixed cellular antibodies which are so typical of allergic processes. By attracting the antigen to the cell and reacting with it on the cell surface, these tissue antibodies explain the positive character of the symptoms. As Lewis[5] has described, the reaction on the cell surface produces a cell injury which in turn results in the liberation of those histamine-like

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substances which are normal constituents of the cell contents. Incidentally, these same tissue antibodies explain the positive reactions which occur when the antigen is applied to the skin; they are characteristic of allergy as they are of anaphylaxis.

In immunity, no reaction occurs because the antibodies are predominantly in the circulating blood where they can destroy or modify the antigen before it can make contact with the cells. In the normal, no reaction occurs because there are no antibodies.

However, the dose of serum or of any foreign substance induces the formation of antibodies which may develop to such concentration as to react with the remains of antigen and precipitate a reaction called serum disease.

Serum disease is important because it suggests a similar mechanism in the cases of measles, scarlet fever, syphilis, and perhaps meningitis where rashes of various kinds appear to follow the primary local infection. Whether these other rashes are toxic and depend upon a certain quality of the invading organism, or whether they are allergic and depend upon a peculiar type of reaction on the part of the individual is doubtful. The toxic theory is suggested by the fact first, that the character of the rash differs in different diseases and second. that it can sometimes be neutralized by local injections of antitoxic sera. On the other hand, the dependence of serum disease upon antibodies is the chief argument in favor of the allergic character of this and other rashes. An incubation period is the rule. Incidentally, the rash of scarlet fever in its later stages can be no longer neutralized by antitoxin. This whole question, however, is still under discussion.

Skin reactions elicited with bacterial products whether they consist of a delayed inflammatory response following the injection of protein substances like tuberculin, or whether they consist of an immediate urticarial response following the injection of specific bacterial carbohydrates depend in each case upon antibodies and are, therefore, to be classed as "allergic." The solution of all these problems depends upon an understanding of the production and function of antibodies.

It should be emphasized that serum disease is a normal response of the normal person. Furthermore, the differences between this normal response with its ten-day incubation period and the acute shock occurring within a few minutes are quantitative rather than qualitative. Antibodies may be many or few; they may be attached to cells or occur free in the blood or they may be in both situations at the same time. The differences are of degree rather than of kind.

The production of antibodies in general is a normal function. Allergy is a reaction of a particular kind which is characterized by the easy formation of cellular antibodies in great abundance.

Several clinical features are of especial interest. The finding of multiple skin reactions is the rule. Evidently sensitiveness is acquired

to several different substances at the same time or perhaps at different times, because we frequently find that while certain results fit in with the patient's present symptoms, other positive findings represent his past history rather than his present illness. "I used to be poisoned by eggs, or to be unable to ride behind a horse, or to have hay fever in June," are not uncommon statements. As a corollary to this finding of multiple sensitiveness, goes the second finding of different manifestations of allergy in the same patient. We find that at least a third of those persons who have one allergic manifestation, have had in the past or do have in the present, some other manifestation beside the presenting symptom. Combinations such as asthma and eczema or asthma and hay fever in the same patient are as characteristic as are multiple skin tests.

These clinical features suggest that Von Pirquet's conception of allergy as a "Reaktionsfähigkeit"; as a capacity to react to foreign substance should be extended to include the capacity to develop a hypersensitiveness to them and to do it easily. This extension of the definition should make the clinical management of these individuals somewhat easier. When the individual has several different allergic symptoms at one time; when his family history shows allergy in his antecedents, in his children or perhaps in both; when his symptoms are severe or when his skin tests are large, that individual may be assumed to have an easy tendency to develop hypersensitiveness. He is "allergic" only in this sense. Any specific treatment should be given with great care.

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ALLERGY DUE TO SILK*

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PROTEIN sensitization accounts for many eczemas. Most of these have been ascribed to foods. Eczemas caused by contact of the skin to a foreign protein have been rarely described.

One of the most interesting of the contact eczemas is that caused by silk. My impression is that it is not as rare an occurrence as the literature indicates. Therefore a questionnaire, to determine the frequency of silk allergy and other clinical facts, was sent to fifty allergists. I have tabulated the results of the questionnaire and have divided the cases into two groups.

One group consists of those cases giving positive skin reactions to silk and in which the clinical relation was definitely established. Another group consists of cases also giving a positive skin reaction to silk but in which no clear-cut relation to the clinical symptoms could be proved or in which positive reactions to many other things complicated the picture. Forty-eight replies were received.

There was a total of 105 skin reactions to silk, including cases of eczema, urticaria, rhinitis, and asthma. There were 120 skin reactions to several proteins as well as silk, and they represent combinations of urticaria and asthma, rhinitis and eczema, and asthma and eczema.

Cases of eczema due to contact to silk protein alone were 22 in number, including two of my own. Of these, nine were proved by passive transfer. Matthew Walzer reported six cases proved by passive transfer, with excellent results following the removal of the offending protein. Figley reported one proved case in which asthma was also present. An excellent result followed after the offending protein was removed. A short review of my two cases follows:

CASE 1.—V. P., female, aged four years.

Eczema was first noticed at the age of two months, following the wearing of a silk veil. It first appeared on the head and face and soon spread to the rest of the body. At the age of three months, urticaria developed and at the age of two years asthma began. When one year old, the child was given a small amount of egg and the tongue and lips began to swell and vomiting occurred. Eggs were discontinued from the diet. Peanuts had the same effect and it was thought that the eczema and asthma were due to a food. One day, the child was playing

*From the Asthma and Hay Fever Clinic, Northwestern University Medical School.
Read before the Eighth Annual Meeting of the Association for the Study of Allergy, Detroit, June 24, 1930.

with a silk necktie around her neck and the mother noticed many small hives on the skin where the necktie had rubbed. A small piece of silk rubbed locally over a normal skin area produced many small urticarial-like lesions which became conglomerate and arranged themselves in patches resembling the other eczematous lesions. Cutaneous skin tests were done with the following results:

Egg white	++
Egg yolk	+++
Ovomucoid	+++
Egg whole	++++
Peanut	++++
Banana	++++
Silk	++++

Passive transfer was done on a nonallergic adult. Rubbing a piece of silk on the passive transfer site produced a large wheal with considerable erythema. Cutaneous and intracutaneous tests with silk solution 1:1000 were positive ++++. The Walzer reaction was demonstrated after eating a few peanuts. The local passive transfer site was gradually desensitized by intracutaneous injections of gradually increasing strengths of silk protein solution until finally no reactions were obtained.

The treatment consisted in removing all contact to silk and the substitution of cotton. The eczema cleared up rapidly. The asthma stopped after avoiding eggs, peanuts, and bananas. An attempt is being made at present to desensitize the child against silk by gradually increasing injections of silk protein solution.

CASE 2.—B. D., female, single, white, aged twenty-eight years.

The patient complained of an excessive scaly weeping eruption on the folds of the skin. Itching was extreme at night. This eruption first appeared when she was six months old and had been present ever since. At times it would be somewhat better, only to reappear again. She had been unable to work because of the appearance of her hands and face.

The only significant facts in the past history were measles, chicken pox, scarlet fever, pneumonia, whooping cough and bronchitis in childhood. Urticaria and prickly heat in infancy.

The physical examination was negative except for the extensive eczema practically all over the body. She was treated by various dermatologists without relief.

Skin tests were made on the anterior surface of the thighs as all other areas were unavailable because of the extensive eczema. A markedly positive reaction to silk was obtained after cutaneous tests. This is the only protein to which this patient has shown any positive reaction. She was requested to discard all silk clothing and substitute

cotton. Immediate improvement followed and after one week the itching stopped and the eczema began to improve considerably. At present, after two years, the skin is clear.

Passive transfer was done on a nonallergic individual. Four-plus (++++) reactions were obtained after cutaneous, intracutaneous, and contact tests.

An attempt was made to desensitize this patient but the local and systemic reactions were rather severe in spite of very small dosage, and she refused further treatment. Reagin is still present in the blood, as demonstrated by positive skin tests to silk as well as positive reactions following passive transfer.

TABLE I

RESULTS OF QUESTIONNAIRE REGARDING SKIN REACTIONS TO SILK, SENT TO 50 ALLERGISTS

Total skin reactions due to silk	105
Total cases clinically proved	
Eczema	22
Urticaria	4
Rhinitis	0
Asthma	1
Cases showing skin reactions to silk but in which no etiologic relationship could be proved	
Eczema	38
Urticaria	17
Rhinitis	33
Asthma	32

CONCLUSIONS

Eczema due to silk has been rarely described in the literature.

The results of a questionnaire sent out to a number of allergists indicate that this sensitization is more common than ordinarily considered.

There is a definite tendency for silk protein to give nonspecific reactions which must be carefully separated from the specific reactions.

It is suggested that the problem of sensitization in eczema due to contact with silk and other proteins be given more attention in the examination of the patient.

I wish to acknowledge with thanks the answers received to the questionnaire and also the valuable assistance received from S. M. Feinberg.

55 EAST WASHINGTON STREET.

Society Proceedings

THE ASSOCIATION FOR THE STUDY OF ALLERGY

EIGHTH ANNUAL MEETING, DETROIT, MICH., JUNE 24, 1930

Abstracts of Proceedings

Report of a Case of Diarrhea Due to Cow Hair. KATHERINE B. MACINNIS, M.D., BINGHAMPTON, NEW YORK.

A woman of forty years complained of uncontrollable diarrhea. She lived on a farm and was well until 1918 when diarrhea first occurred. This persisted as long as the patient remained at home and, at times, was severe. It is noteworthy that whenever the patient was away from home the diarrhea promptly stopped.

Repeated examination of the water supply revealed nothing suspicious, and there were no other such cases in the family of five. Skin tests to seventy-six allergens revealed moderate reactions to several foods including milk. The patient was instructed to keep away from the barns and to do no milking. On conforming to these instructions, the diarrhea promptly disappeared, only to return when the patient again began milking the cows. Skin reactions to this milk gave only a plus-minus reaction. However, positive scratch and intradermal tests to cow hair were distinctly positive.

Desensitization with a mixture of cow hair extract, containing some horse hair and cattle hair, was begun, the initial dose being 0.1 c.c. of a 1 to 100,000 dilution. The patient did very well while receiving this treatment and was able to resume milking with but one relapse. A recent report states that the diarrhea associated with an eruption similar to that of pellagra has recurred but no data concerning contact with cows are mentioned.

Report of Work Being Done in European Allergy Clinics. ALEXANDER STERLING, M.D., PHILADELPHIA.

Pasteur Institute, Paris.—Dr. Besredka was interviewed and expressed the opinion that a skin reaction is not essential to identify asthma, hay fever, etc., with allergy. No clinical work is carried on at the Institute although animal experimentation in allergy is being conducted.

Koch Institute, Berlin.—An allergy clinic is conducted but most of the allergens used come from American manufacturers. Very few cases of hay fever are seen, most are asthmatics.

Charité Hospital, Berlin.—Here treatment with filtered air is used. Six to eight patients can be treated at one time. They recline on steamer chairs and a mask similar to the gas mask used in war time is applied. This is connected with a pipe containing filtered dust-free air. Often the patients sleep during the treatment and are relieved from attacks.

S. Van Leeuwen Hospital, Leiden, Holland.—This apparently is the only hospital devoted to allergic conditions on the continent. It has forty beds. The rooms are supplied with filtered air which comes in through an iron pipe about two feet in diameter and 125 feet in height. The air is pumped into an iron chamber from which it is delivered to the rooms. A valve at the top of each room lets out used air. Patients are tested routinely for sensitivity and treated accordingly. Tuberculin is used for the nonsensitive cases. Likewise, sulphur in olive oil is injected intramuscularly as a nonspecific agent. This is given in small doses if no reaction is desired or large doses to provoke a constitutional hyperpyrexia.

St. Mary's Hospital, London.—Dr. Freeman uses seasonal treatment for hay fever. Patients are admitted to the hospital when the season begins, and they receive increasing doses of pollen extracts every hour and a half for three or four days with good results. Testing is done by pricking the skin through a drop of extract. A mixed vaccine containing organisms from pooled sputa of asthmatics is used for asthma.

Guy's Hospital, London.—Research work under the British Asthma Commission is being carried on here. Dr. Oriel who conducts it, found that all allergic conditions give product in the urine. This has been isolated and found to be a protein substance, probably a secondary proteose. When injected into the skin of the patient from whom it is isolated, it gives a positive reaction but not in normal controls. It appears in the urine only during an attack, and not in the free intervals. It is not histamine. When injected into the patient in very minute doses, it causes a recrudescence of symptoms.

The Asthma Commission is also studying allergic diseases from the standpoint of nitrogenous and carbohydrate metabolism. They find that in the beginning of an asthmatic attack there is an acidosis and toward the end, an alkalosis. Hence aromatic spirits of ammonia are suggested; also glucose to elevate an associated hypoglycemia.

Vaccines of cultures incubated at 22° C. to enhance production of moulds are also being tried.

Great Ormond Street Hospital for Children.—Here gastric analyses are being done in children with allergy. The majority of children with asthma show an achlorhydria. Dilute hydrochloric acid and pepsin is given with good results. When adrenalin is necessary, it is found effective when given orally with dextrose and hydrochloric acid, and these are made up so that each dose contains:

℞	Adrenalin hydrochloride 1 to 1000 Sol.	m. V
	Dextrose	gr. XX
	Dilute hydrochloric acid	m. XV
	Syrup of Senna	m. XV
	Chloroform water q.s.a.d.	3ii

This is given during attacks, every hour or as often as is necessary.

Cardiovascular Phenomena and Allergy. GEORGE L. WALDBOTT, M.D., DETROIT.

It is pointed out that wheal formation, which is a characteristic lesion of allergy, results from increased permeability of blood capillaries. This reaction is perhaps the dominant physiologic change in all types of protein sensitization. Also, anaphylactic shock is characterized by a fall in arterial blood pressure, and drugs most effective in combating allergic reactions act both on the capillaries and on the heart.

There are some cardiovascular manifestations which occur in association with allergy to which little attention has been directed. In heat sensitiveness, it appears that the capillaries of the heat regulating organs are involved. Likewise, it has been shown that during reactions of physical allergy, there are great variations in blood pressure and pulse rate and also alterations in the electrocardiogram.

The author has noted the association of allergy and hypertension in three families. In one member, sensitive to milk and other foods, an essential hypertension of twenty-five years' duration was markedly reduced by eliminating the offending allergens. This suggestive association between allergy and hypertension is confirmed by Lintz who reported that among three hundred cases of essential hypertension, 50 per cent gave a direct history or family history of allergy. Attention is also called to the association between essential hypertension and sensitiveness to heat or cold reported by Kaufman.

Cases are cited to illustrate various examples of the association of both hypotension and hypertension with allergic processes.

Sanitarium Treatment of Asthma and Other Allergic Conditions. ZELLA WHITE STEWART, M.D., IOWA CITY.

The value of sanitarium treatment for cases of allergy is discussed. The environmental factors, especially dust-producing articles found in houses, are eliminated in the sanitarium described. No upholstered furniture containing animal hair is used, and such furniture contains only cotton, tapestry and velour. Mattresses made of cotton and feather pillows with dustproof covering are employed. Woolen blankets and rugs are eliminated. Orris-free face powder only is permitted. No smoking in the sanitarium is allowed, as patients sensitive to tobacco may be affected by tobacco odor, and tobacco smoke is an irritant to

patients with asthma during an attack. Desensitization treatments are given to pollen-sensitive patients with good success.

Concerning skin testing, the author offers the following opinions: (1) The size of a reaction does not indicate corresponding importance of clinical sensitiveness. An area of erythema in one patient may be just as significant as a wheal and erythema in another; (2) the size of different reactions in the same individual is not indicative of relative clinical importance. (3) Skin tests are often present after clinical hypersensitiveness has disappeared and they may represent past history rather than present illness. (4) Many reactions to foods can be ignored when the major factors in the inhalant group have been eliminated. Cases are cited to illustrate the points mentioned.

Celery, chocolate and tomatoes are never served as these so often give skin reactions.

An important factor in sanitarium treatment is the education of the patient who learns to look for offending allergens on returning home.

A summary of the results of one hundred and fifty-two cases admitted to the sanitarium shows:

1. All patients who entered with a severe attack of asthma, asthmatic bronchitis, wheezing and shortness of breath on exertion, cleared up entirely on leaving. Only two cases have had severe attacks during their stay.

2. All patients, with a single exception, gave positive reactions with cutaneous or intradermal tests.

3. The usual time spent in the sanitarium by adults was three to four weeks, and in the case of children, one to two weeks.

4. Practically all patients after returning home have had some recurrence of symptoms until they learned the necessary precautions to be taken.

Department of Reviews and Abstracts

Selected Abstracts

Binger, M. W., Gaarde, F. W., and Markowitz, J.: A Study of Bronchial Reflexes in the Guinea Pig. Proceedings of the Staff Meetings of The Mayo Clinic **5**: 156, 1930.

To investigate the possible part played by reflex contraction of the bronchioles in the mechanism of asthma, a series of experiments was performed on the innervation of the mammalian bronchioles.

The guinea pig, because of its known susceptibility to anaphylactic shock, was the animal used. Curarization was employed, since by this means the reflexes are preserved but any influence of voluntary muscle contraction is ruled out. The trachea of the curarized guinea pig was cannulated and attached to an artificial respiration apparatus.

Resistance of respiratory excursions due to bronchospasm was measured by a piston recorder attached to the tube connecting the respiration apparatus to the guinea pig. Pulmonary excursions were measured by means of a trocar needle introduced into the pleural cavity and attached to a piston recorder.

It was noted that the bronchioles were in a state of constant activity, reacting to such stimuli as the slamming of a door, tapping of a table, etc.

Sectioning the vagus nerves in the neck or paralyzing doses of atropine, or both, did not abolish these reflexes. The parasympathetic nerves having been eliminated, it is concluded that both dilator and constrictor reflexes are carried by the sympathetic nerves to the bronchial muscles.

Further experiments along these lines are being carried out by the authors.

Bray, G. W.: The Hereditary Factor in Asthma and Other Allergies. Brit. M. J. **1**: 384, 1930.

The material on which this communication is based consists of two hundred consecutive unselected cases of asthma, the patients attending the asthma clinic at the hospital for sick children, Great Ormand Street, London. In eliciting a family history, inquiry concerning the following conditions was made: asthma, hay fever, eczema, urticaria, and migraine. Care was taken to exclude such of these conditions which did not seem allergic in origin. In all, 4152 relatives were considered, an average of 20 per cent. As no patient attends the

hospital after the age of twelve years, the two hundred cases comprise children whose asthma had its origin in the first decade of life. The data are listed statistically, and comparison with published figures of other authors is made.

The author recites established opinion that the allergic diathesis is transmitted as a Mendelian dormant; that the greater the heredity, the earlier are the symptoms manifested; that the earlier in life an individual becomes sensitive, the greater the tendency to multiple sensitization; and that a child born to a family with a pure hay fever lineage is much more likely to become affected with hay fever than with asthma and vice versa.

In addition, the main deductions from this study are as follows:

1. Puberty must exert some beneficial effect upon the symptoms in the male and some deleterious effect upon the female, for before puberty the incidence of males to females is over two to one while from puberty onwards it is less than one to one.

2. Heredity plays a very little part in determining the age at onset of symptoms during the first decade.

3. Transmission appears to be twice as frequent through the female as through the male, for (a) when there is a unilateral family history it is twice as frequently on the mother's side as the father's; (b) when the parents are unaffected, the transmitter is twice as often the female; (c) when the male is unaffected, and the female has or may transmit the tendency, twice as many are affected with allergy as when the male is affected or is a transmitter and the female is quite free.

4. A positive family history of allergy is present in about 70 per cent of cases of asthma in children—in over 50 per cent unilateral, in nearly 20 per cent, bilateral, and 10 per cent appears to be this maximum incidence in the families of presumably normal persons.

Bernton, H. S.: Asthma Due to a Mould Aspergillus Fumigatus. J. A. M. A. **95**: 189, 1930.

A case report is given of a woman who had suffered from asthma for nine years, the first attack having occurred after the patient had lived for four years in a damp musty house. Skin tests to extracts of pollen, food and epidermal proteins, and house dust had repeatedly given negative reactions.

Skin test with extract of Aspergillus fumigatus gave a positive reactiontion and treatment by subcutaneous injection of a dilution of 1 to 5,000 gave marked local reaction and asthmatic symptoms of such severity that treatment was discontinued.

The patient was the only one of a series of one hundred and twenty-five to react positively to mould reagents.

Colmes, A., and Rackemann, F. M.: Studies in Asthma. IX. Cough as a Manifestation of Human Hypersensitiveness. J. A. M. A. **95:** 192, 1930.

Three case reports are given in which a cough of considerable duration and severity is traced to an allergic source. Relief was obtained upon treatment. The authors suggest that unexplained cases of cough may frequently be due to allergy. It is particularly noted that in many instances an existing hypersensitiveness manifests itself only in the course of an acute infection, so that contact with the offending allergen in the presence of a cold or some other infection may result in asthma where contact without such complication would produce no symptoms.

Lyon, D. M., and Murray-Lyon, R. M.: Asthma: Results of Treatment. Brit. M. J. **1:** 987, 1930.

A report is made upon the results of treatment of two hundred and ninety-one cases of asthma at The Royal Infirmary of Edinburgh. The cases improved and were cured by treatment, total 66 per cent; 12.4 per cent died. No uniform treatment was given, each case being treated individually according to its different requirements. It was found, in general, however, that the best results were obtained when contact with an offending protein could be eliminated. Cases showing a multiple sensitivity yielded less readily. In cases complicated by respiratory infections, considerable success was obtained by the use of autogenous vaccines made from a laryngeal swab. Good results were not obtained often by nasal operation, and it was suggested that operation never be recommended as a cure for asthma and be resorted to only when it appeared desirable for other reasons.

Cases of long duration and those with an early age of onset yielded less readily to treatment than those with onset in the second and third decade of life. A large percentage of cases commencing after the age of forty were also found to be unfavorable.

Barlow, O. W., and Frye, J. F.: The Antiasthmatic Efficiency of Epinephrine, Ephedrine and Atropine. Arch. Int. Med. **45:** 538, 1930.

The influence of antiasthmatic drugs on the course of attacks under controlled and comparable conditions was tested upon a patient in whom attacks could be induced by exercise. The criterion for the presence and course of asthmatic attacks were subjective symptoms, respiratory movements and volume and the degree of emphysema present. Records of the volume of the chest and the respiratory excursions were made by means of a pneumograph and tambour, registering on a smoked drum. Records were obtained of asthmatic attacks occurring under normal conditions and before, during and after the symptomatic treatment of induced attacks.

Results showed a striking contrast between the efficiency of epinephrine and ephedrine in time of action in relieving symptoms in induced asthmatic attacks. Symptomatic relief was apparent within thirty to sixty seconds after the administration of epinephrine.

The subcutaneous administration of ephedrine sulphate in from 45 to 75 mg. doses resulted in slow relief, the effect becoming evident after twenty-five minutes. Relief by the administration subcutaneously of $\frac{1}{75}$ grain of atropine sulphate failed to relieve symptoms within fifty-five minutes.

Studies carried on over a period of three years showed that epinephrine was effective in all attacks, ephedrine was effective in mild attacks. Atropine was considered unsatisfactory and its use discontinued.

Oehme, C., and Paal, H.: Studies on the Reid Hunt Reaction, Especially in Bronchial Asthma. Med. Klin. **26:** 454, 1930.

The Reid Hunt reaction is a test for hormones in the blood stream. It depends on the protection of white mice by acetonitril against the toxic action of these substances. When the test was applied to the sera of thirty patients with Basedow's disease, it was positive in all instances, whereas in forty-six cases of nontoxic goiter, it was consistently negative. In seventeen cases of bronchial asthma, the test was positive in twelve and negative in five. Various other conditions gave occasional or negative response. It was found, moreover, that in periods of asthmatic attacks, the test was strongly positive whereas during a long free interval, the test would become negative. From these observations it is inferred that attacks of bronchial asthma are connected with thyroid excess, probably through stimulation of the vegetative nervous system by the latter.

Unshelm, E.: The Potassium Content of Serum in Asthma and Spasmophilia. Jahrb. f. Kinderh. **76:** 75, 1929.

For the serum reaction, the method employed was that of Myers and Short and Kramer and Wilkins. With a few exceptions the blood was drawn after fasting and with serum entirely hemolysis-free one hour at the latest after drawing the blood, the analysis was begun. Controls were run which by titration, checked within 0.03 c.c.

In addition to the potassium content, the calcium content was estimated. Results showed: (1) In eight normal adults, the potassium content of the serum was found to be between 19.9 and 21.8 mg. per cent. (2) In twenty children between the ages of three and fourteen years, the content was from 19.5 to 21.6 mg. per cent. (3) In fifteen nurslings the content was 19.4 to 21.7 mg. per cent. (4) In eight adult patients with asthma, in only two instances was the potassium content above 22 mg. (5) In eight children with asthma, in only one case was there a clearly heightened potassium content and in

one case a content in the upper level of the normal per cent. (6) In nine children with spasmophilia, three showed an appreciable rise in the potassium content and two only a slight rise. It was noted, however, that the fluctuation in potassium content had no relationship to the severity of the disease. (7) It was noted that after the eating of food rich in potassium, there was often found an increase in the potassium content of the serum. (8) The calcium content showed no fluctuation of special significance.

Greenberg, D. M., and Gunther, L.: The Diffusible Calcium of the Blood Serum in Allergic Diseases. Arch. Int. Med. **46**: 72, 1930.

In a study of the diffusible calcium of the blood serum, fourteen cases of various allergic diseases were observed. Specimens of blood were generally obtained during fasting. The diffusible calcium was obtained by ultrafilteration of the blood serum through a collodion membrane by the method of Greenberg and Gunther. Analysis of the fourteen cases showed that the calcium values with one exception lay within the normal range of variation.

The diffusible calcium of the serum is "to all purposes physiologically available calcium." That the diffusible and nondiffusible calcium values lie within the normal range is true only because the diffusible calcium is normal. Experience has shown that except in diseases with a marked reduction in serum proteins, physiologic variations in the calcium occur usually in the diffusible calcium fractions.

The authors, while admitting the number of cases to be too small for definite conclusions, point to the fact that the observations in total and diffusible fractions of the blood serum vary together within the normal range in allergic diseases, indicates that physiologically available calcium is present in the blood in adequate amounts.

Waldbott, G. L.: Hypertension Associated with Allergy. J. A. M. A. **94**: 139D, 1930.

Some factors pointing to a connection between allergy and hypertension are discussed. It is admitted that in order to establish clinical proof of such a relationship, "it would be necessary to demonstrate, (1) the occurrence of both diseases in more than an incidental number of cases, (2) the occurrence of hypertension without kidney involvement in a number of allergic families, (3) the fact that the control of the allergic factor influences the hypertension." One such case report is given in detail and five other reports at less length.

In the detailed case report the outstanding features were the presence of hypertension without kidney involvement, an allergic family history, urticaria, eosinophiles, usually sensitivity of the skin to heat, and positive skin tests. Intermittently, a distinct response of the hypertension to the elimination of allergens was noted.

That the blood pressure never permanently decreased to a normal level might, it was suggested, be explained on the basis of multiple sensitization, so that elimination of all offending proteins could not be obtained.

The author concludes that a certain number of cases of "essential hypertension" are allergic in origin.

Hajos, K.: The Therapeutic Use of Parathyroid Extract. Deutsche med. Wchnschr. **56**: 471, 1930.

Experiments upon guinea pigs with different parathyroid extracts revealed the fact that parathyroid extract had an inhibitory effect upon anaphylactic shock. Experiments were then carried out upon patients suffering from various forms of allergic diseases, that is, bronchial asthma, urticaria, Quencke's edema, and vasomotor rhinitis. In the earlier experiments, a preparation was used that could be given intravenously. Later, parathormone, which was more readily obtainable, was used. This could not be given intravenously.

Results on asthmatic cases showed that in the great percentage of cases good results were obtained by the use of parathormone injections in combination with calcium therapy given orally. The relief obtained could not be ascribed alone to the raised calcium content of the blood for the greater number of the patients were first treated with calcium alone without result. Upon treatment with parathormone, in addition, they were much improved or cured.

Vasomotor rhinitis patients were treated with calcium and with 2 to 3 c.c. of parathormone daily, given subcutaneously. Excellent results were obtained.

In cases of urticaria where other therapy had been unsuccessful, results were obtained with parathormone.

Harkavy, J., and Hebold, S.: Bronchial Asthma and Pulmonary Tuberculosis. Am. Rev. Tuber. **21**: 644, 1930.

The question as to the rôle which tuberculosis plays in the asthmatic paroxysm is studied from the following angles: (a) What rôle does true hypersensitiveness to foreign proteins play in the causation of asthmatic symptoms in tuberculosis patients? (b) What part does nonspecific infection play in the induction of asthmatic attacks?

In four hundred cases of bronchial asthma, forty patients were found to have clinical and x-ray evidence of pulmonary tuberculosis. Of these, only eighteen were available for study. Of these eighteen cases, nine were insensitive to protein tests and nine reacted positively. Of the nine sensitive asthmatics, only six were available for study by means of passive transfer, the method considered most satisfactory for this investigation.

Twenty-five cubic centimeters of blood was drawn from the right arm vein, the serum separated and filtered through a Berkefeld filter. Three cubic centimeters of serum from each case was injected 1. p. into guinea pigs to be certain of its sterility.

Tests were made on normal individuals with the protein extracts to which the patients under investigation were sensitive, to rule out spontaneous reactions in the controls. These normal controls were then subjected to the usual procedure in passive transfer of sensitivity. Positive results were obtained, the reaction, however, being confined to one or two proteins, although the patients had given evidence of multiple sensitivity. All of this protein sensitive group were freed of asthmatic attacks by removal of the offending proteins.

The assumption is, therefore, that foreign proteins and not the tubercle bacillus were responsible for the asthma in this group. Of the nine nonsensitive cases, six gave evidence of chronic sinusitis, two bronchiectasis and one a chronic focus of organized pneumonia. The assumption is, therefore, that the asthma in this group was due to complicating respiratory infection and not to the tubercle bacillus.

Sulzberger, M. B., and Wise, F.: Ragweed Dermatitis with Sensitization and Desensitization Phenomena. J. A. M. A. **94**: 93, 1930.

A case report is given of a patient who had suffered for ten years from a skin disease that recurred always in the late summer and fall. There was no family history of allergy. Skin tests by the scratch method, to a large variety of pollens gave negative results. However, the same tests by the contact method, that is, the application of the substances to the uninjured skin for a continuous period of twenty-four hours showed a marked reaction to short ragweed. Desensitization was instituted by intradermal injections. The site of injection was thus that most superficial part of the skin which it is possible to reach in injection treatment. From August 9 to September 4, the intradermal injections were given about three times a week. The initial dose was 0.1 c.c. of Lederle's "Ragweed Pollen Allergen" dose 1, in one area, this being gradually increased to the final dose of 0.1 c.c. each of dose 10 in three areas, totaling 0.3 c.c. After completion of the course of injections the patient was again tested to short ragweed by the contact method with negative result. The dermatitis had improved markedly and there had been no new lesions since August 23.

The author particularly stresses the value of the contact tests in dermatitis of the papular, vesicular, and erythematous nature.

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HAY FEVER

An Advertising Statement

HAY FEVER, as it occurs throughout the United States, is actually *perennial* rather than *seasonal*, in character.

Because in the Southwest—Bermuda grass, for instance, continues to flower until December when the mountain cedar, of many victims, starts to shed its pollen in Northern Texas and so continues into February. At that time, elsewhere in the South, the oak, birch, pecan, hickory and other trees begin to contribute their respective quotas of atmospheric pollen.

But, nevertheless, hay fever in the Northern States at least, is in fact seasonal in character and of three types, viz.:

TREE HAY FEVER—*March, April and May*
GRASS HAY FEVER—*May, June and July*
WEED HAY FEVER — *August to Frost*

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